APPENDIX A

SOIL GAS SURVEY LETTER DATED AUGUST 10, 2005

FREY

FREY ENVIRONMENTAL, INC.

Environmental Geologists, Engineers, Assessors

2817 A Lafayette Avenue
Newport Beach, CA 92663
(949) 723-1645
Fax (949) 723-1854
Email: freyinc@freyinc.com

August 10, 2005
485-01

Chuck Cox
Friends of the Riverside Airport LLC
8175 Limonite Avenue
Riverside, CA 92509

Re: Soil Gas Survey
Agricultural Park
7020 Crest Avenue
Riverside, California

Dear Mr. Cox:

This letter documents and summarizes the results of a soil vapor survey conducted at the Agricultural Park in Riverside, California (Site - Figure 1).

OBJECTIVE

The objective of the soil vapor survey was to assess the presence of volatile organic compounds in the soils beneath the Site.

SOIL VAPOR PROBE LOCATION

Soil vapor probe locations were selected to evaluate those areas of the Site which had the greatest probability of containing or releasing VOCs (tanks, pipes and sludge beds). Soil vapor probes were also placed in areas which had previously been sampled and documented to contain elevated concentrations of PCBs. Finally, selected soil vapor probes were advanced in locations away from the former sewage treatment plant to evaluate the potential for VOCs to migrate onto the Site. Twenty four soil vapor probes were advanced and sampled in the locations shown on Figure 2.

ADVANCEMENT AND SAMPLING OF SOIL VAPOR PROBES

FREY Environmental, Inc. (FREY) marked the location of the soil vapor probes on December 15, 2003. The soil vapor survey was conducted on December 15 and 16, 2003.

Prior to probe advancement, FREY personnel measured and cut Spiralite 510 clear vinyl tubing into 7 foot lengths (the tubing). Tubing was cut prior to probe advancement to insure that all soil vapor probe tubing were similar in length. The bottom 2-inches of the tubing were slit with a knife to allow for vapor to enter the tubing. The manufacturer listed the tubing as having an inner diameter of 0.125 inches.

Prior to the initiation of field activities, FREY calculated the volume of the tubing (0.1145 cubic feet) and sand pack (0.0164 cubic feet) to be 0.1309 cubic feet (3.7 liters).

Soil Vapor Sample Collection

Kehoe Testing & Engineering (Kehoe) was subcontracted to drive the soil vapor probes to depths of 5 feet below the ground surface (bgs) with a direct push drill rig, where truck access was possible. A number of probes were located in areas inaccessible to the direct push drill rig. These probes were manually driven with a jackhammer. Each soil vapor probe consisted of one 1-inch diameter, hollow, steel rod equipped with a cone shaped drive point. The clear vinyl tubing ran down the center of the hollow rod and was connected to the drive point.

After the probe point had reached the desired depth of five feet. The steel rod was raised with a jack resulting in an approximate two-inch separation between the steel rod and the probe point. Approximately 3 inches of a screen washed sand was placed in the annulus between the clear vinyl tubing and the steel rod. This process was repeated until approximately 12 inches of sand had been emplaced in the annulus between the tubing and the steel rod. The steel rod was then retracted an additional six to eight inches at a time and bentonite sand was placed down the annulus between the tubing and the steel rod. The bentonite sand was wetted to ensure proper probe sealing. This process was repeated to the ground surface. At the surface, the bentonite sand was placed in cone around the protruding vinyl tubing. A small amount of water was placed on the bentonite sand until pasty composition was noted. A slip fitting sampling valve, in the closed position, was placed on the end of the clear vinyl tubing of each soil vapor probe.

A minimum of 30 minutes passed before the soil gas probes were purged as part of the soil gas sampling process. A low flow peristaltic pump was used to purge 12 liters of vapor from each soil vapor probe. The purge rate was limited to less than 200 milliliters per minute.

After probe purging, a gas tight syringe was used to collect the soil vapor samples from each vapor probe. A chemist from Baseline On-Site Analysis (Baseline) performed all soil vapor sample collection activities. The syringe was immediately transported to the on-Site mobile laboratory provided by Baseline. Soil vapor samples were injected into the mass spectrometer for chemical analyses within 5 minutes of vapor sample collection.

Upon completion of soil vapor sampling, the tygon tubing was either cut off approximately 6 inches bgs and backfilled with wetted bentonite sand or was manually extracted from the ground.

Soil Vapor Sample Laboratory Analyses and Results

Soil vapor samples were analyzed for volatile organic compounds including fuel oxygenates in accordance with EPA Method No. 8260B in a mobile laboratory provided by Baseline on December 15 and 16, 2003. Concentrations of VOCs were not detected in any of the 24 soil gas samples collected from the Site on December 15 and 16, 2003. Laboratory reports and chain of custody documentation have been attached in Appendix A.

CONCLUSIONS

Based on the results of the soil vapor survey, FREY concludes that volatile organic compounds are not present in significant quantities in subsurface soils.

LIMITATIONS

The information described is within the limits of the scope of work authorized and pertain to conditions present at the time the work was performed. Future conditions may differ from those described herein, and this report is not intended for future evaluations of this Site unless an update is conducted by a consultant familiar with environmental assessments.

This report was compiled partially on information supplied to FREY Environmental, Inc. from outside sources and a visual inspection of the property. FREY Environmental, Inc makes no warranty as to the accuracy of information provided by others which may be contained in this report, nor are any other warranties or guarantees, expressed or implied, included or intended by the report, except that it has been prepared in accordance with the current accepted practices and standards consistent with the level of care and skill exercised under similar circumstances by other professional consultants or firms performing similar services.

Site conditions may change with time as the result of natural alterations or man-made changes on this or adjacent properties. Future environmental investigations conducted at the Site may reveal Site conditions not indicated in the data collected by FREY Environmental, Inc. Additionally, changes in standards or regulations applicable to the Site may occur. The findings of this report may be partially or wholly invalidated by changes of which FREY Environmental, Inc. is not aware or has not had the opportunity to evaluate.

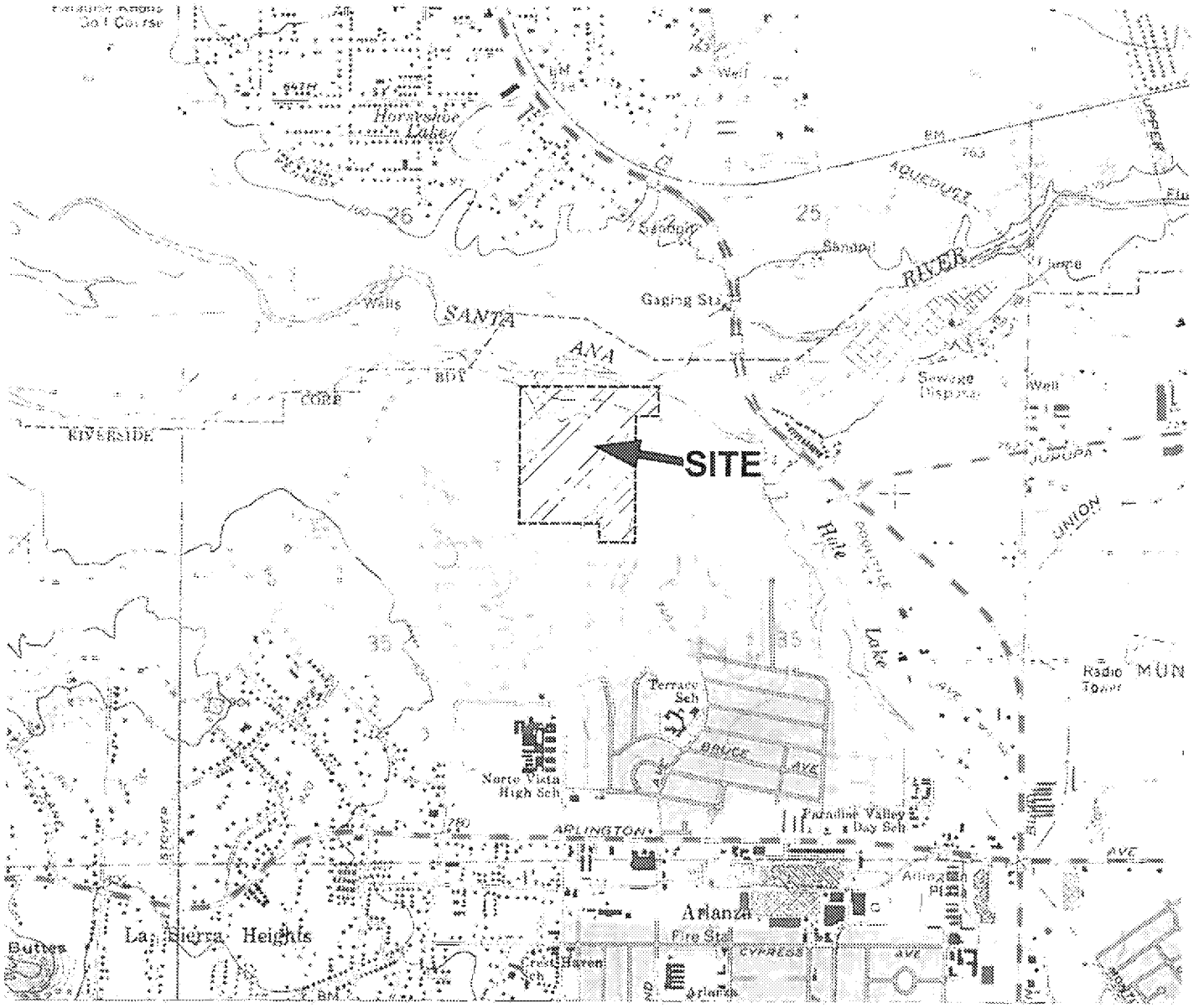
Environmental assessments provide an additional source of information regarding the environmental conditions of a particular property or facility. The report to the Client is dependent upon FREY's knowledge and information obtained during the course of performance of the services.

Please contact me with any questions at (949) 723-1645.

Sincerely,
FREY Environmental, Inc.

Evan Privett
Senior Project Geologist
PG #7880

Attachments
Figure 1 - Site Location Map
Figure 2 - Site Sketch Showing Soil Gas Probe Locations
Appendix A - Laboratory Reports



NORTH

0 1/2 1

SCALE IN MILES

AGRICULTURAL PARK
RIVERSIDE, CALIFORNIA

Client: FRIENDS OF THE RIVERSIDE AIRPORT LLC

Project No.: 485-01

FREY ENVIRONMENTAL, INC.

NOTE:

1) All locations and dimensions are approximate.
2) Base map from USGS 7.5 minute California topographic quadrangle, printed from Topo.

SITE LOCATION MAP

Date: AUGUST 2005

Figure: 1

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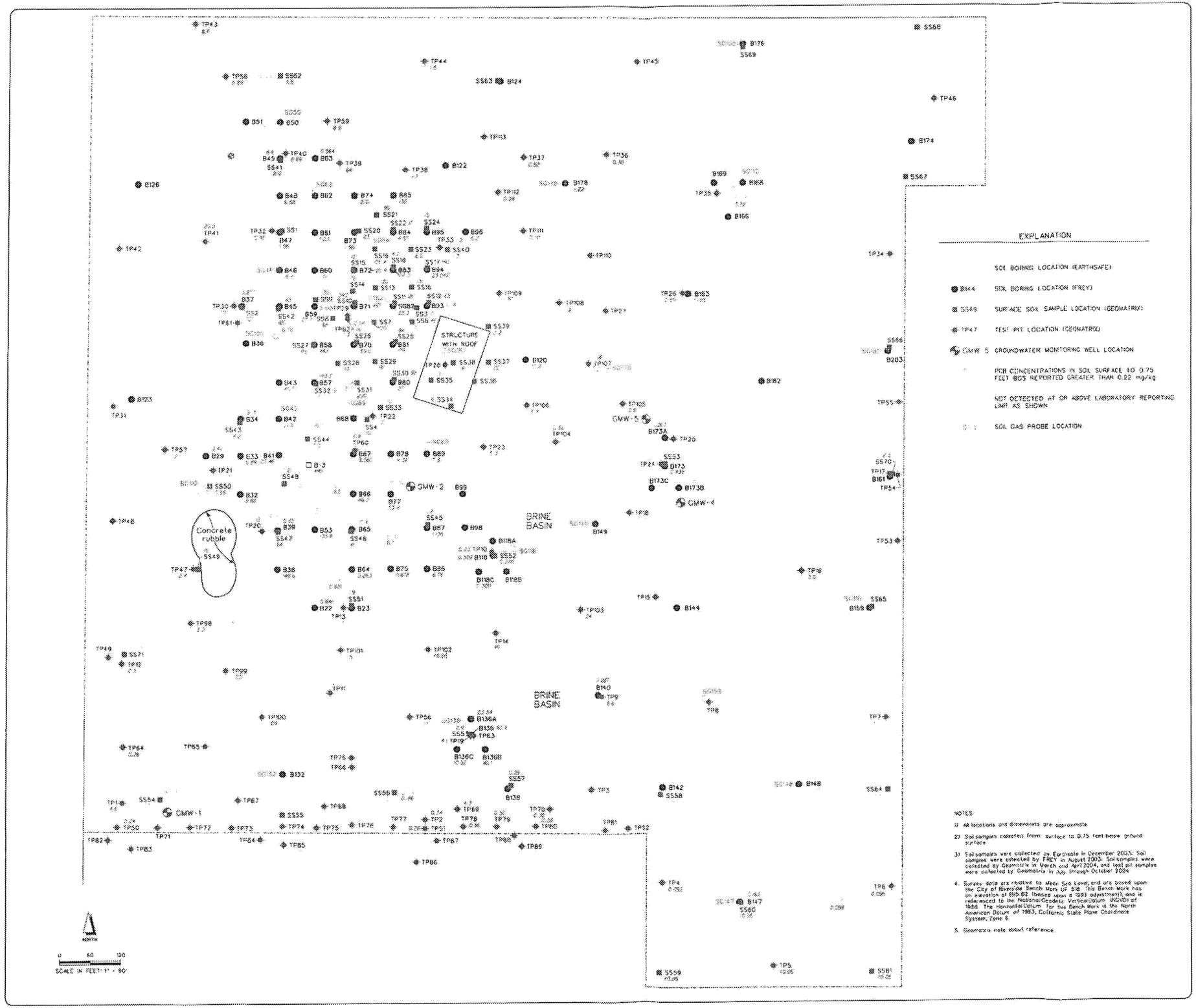

EXPLANATION

- SOE BORING LOCATION (EARTHSAFE)
- B144 SOIL BORING LOCATION (FREY)
- SS48 SURFACE SOIL SAMPLE LOCATION (GEOMATRIX)
- TP47 TEST PIT LOCATION (GEOMATRIX)
- GMW-5 GROUNDWATER MONITORING WELL LOCATION
- PCB CONCENTRATIONS IN SOIL SURFACE TO 0.75 FEET BGS REPORTED GREATER THAN 0.22 mg/kg
- NOT DETECTED AT OR ABOVE LABORATORY REPORTING LIMIT AS SHOWN
- SG-1 SOIL GAS PROBE LOCATION

NOTES:

1) All locations and dimensions are approximate.

2) Soil samples collected from surface to 0.75 feet below ground surface.

3) Soil samples were collected by Earthsafe in December 2003. Soil samples were collected by FREY in August 2005. Soil samples were collected by Geomatrix in March and April 2004, and test pit samples were collected by Geomatrix in July through October 2004.

4. Survey data are relative to Mean Sea Level, and are based upon the City of Riverside Bench Mark UF 618. This Bench Mark has an elevation of 895.82 (based upon a 1973 adjustment), and is referenced to the National Geodetic Vertical Datum (NGVD) of 1988. The Horizontal Datum for this Bench Mark is the North American Datum of 1983, California State Plane Coordinate System, Zone 6.

5. Geomatrix note about reference.

REVISIONS	BY

CLIENT
FRIENDS OF THE
RIVERSIDE AIRPORT, LLC

SITE SKETCH
SHOWING SOIL GAS PROBE LOCATIONS
AIRPORT TERMINAL PARKS
RIVERSIDE, CALIFORNIA

FREY ENVIRONMENTAL, INC.
2302 A MARGUERITE AVE.
NEWPORT BEACH, CA 92663
(949) 723-1845

DRAWN	KV
CHECKED	EP
DATE	JULY 9, 2008
SCALE	AS SHOWN
JOB NO.	485-01

Figure 2

485-01\485001-20.dgn

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APPENDIX A

LABORATORY RESULTS

Baseline On-Site Analysis
P. O. Box 2243
Huntington Beach, CA 92647

Toll Free: 888.753.7553
FAX: 714.840.1584

Laboratory Report

Client: FREY Environmental, Inc.
Client Address: 2817-A Lafayette Avenue
Newport Beach, California 92663

Project Name: AG PARK
Project Address: ---

Contact: Evan Privett

Report Date: 12/31/03
Lab Project Number: 03386
Client Project Number: 485-01

Dates Sampled: 12/15-16/03
Dates Received: 12/15-16/03
Dates Analyzed: 12/15-16/03
Sample Matrix: Vapor

Analyses Requested:

1. **EPA 8260B – Volatile Organic Compounds**

Baseline received samples from the project shown above. A Chain-of-Custody Record (COC) is attached.

Baseline analyzed the samples for the parameters shown above per the COC. In this report, *Baseline* presents the results and QA/QC summary for these analyses.

Brian K. Kato

Approved
Brian K. Kato, Laboratory Manager

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BASELINE ENVIRONMENTAL ANALYSIS

Baseline On-Site Analysis
P. O. Box 2243
Huntington Beach, CA 92647

Toll Free: 888.753.7553
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Laboratory Report

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Lab Project Number: 03386
Client Project Number: 485-01

Project Name: AG PARK
Project Address: ---

Contact: Evan Privett

Dates Sampled: 12/15-16/03
Dates Received: 12/15-16/03
Dates Analyzed: 12/15-16/03
Sample Matrix: Vapor

Volatile Organic Compounds (EPA 8260B) - Part I

EPA Method:	8260B	8260B	8260B	8260B	8260B	8260B
Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Dilution Factor:	1	1	1	1	1	1
Sample ID:	**SG-132**	**SG-185**	**SG-110**	**SG-116**	**SG-105**	**SG-112**
Compound Name						
Volatile Aromatics (BTEX)						
Benzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Toluene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Ethylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Total Xylenes	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Fuel Oxygenates						
Methyl t-Butyl Ether (MTBE)	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
t-Butanol (TBA)	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
Di-Isopropyl Ether (DIPE)	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Ethyl t-Butyl Ether (ETBE)	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
t-Amyl Methyl Ether (TAME)	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Non-Halogenated VOC's						
n-Butylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
sec-Butylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
tert-Butylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Isopropylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
p-isopropyltoluene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Naphthalene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
n-Propylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Styrene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2,4-Trimethylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,3,5-Trimethylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Halogenated VOC's (HVOC's)						
Bromobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Bromochloromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Bromoform	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Bromomethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Carbon Tetrachloride	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
2-Chlorotoluene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
4-Chlorotoluene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Chlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Chloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Chloroform	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Chloromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0

ND: Not detected at the indicated reporting limit.

BASELINE ON-SITE ANALYSIS™
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FAX: 714.840.1584

Laboratory Report

Client: FREY Environmental, Inc.
Client Address: 2817-A Lafayette Avenue
Newport Beach, California 92663

Report Date: 12/31/03
Lab Project Number: 03386
Client Project Number: 485-01

Project Name: AG PARK
Project Address: ---

Contact: Evan Privett

Dates Sampled: 12/15-16/03
Dates Received: 12/15-16/03
Dates Analyzed: 12/15-16/03
Sample Matrix: Vapor

Volatile Organic Compounds (EPA 8260B) - Part II

EPA Method:	8260B	8260B	8260B	8260B	8260B	8260B
Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Dilution Factor:	1	1	1	1	1	1
Sample ID:	**SG-132**	**SG-185**	**SG-110**	**SG-116**	**SG-105**	**SG-112**
Compound Name						
HVOC's, continued						
Dibromochloromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dibromo-3-Chloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dibromomethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,3-Dichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,4-Dichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Dichlorodifluoromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1-Dichloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dichloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1-Dichloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
cis-1,2-Dichloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
trans-1,2-Dichloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dichloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,3-Dichloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
2,2-Dichloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1-Dichloropropene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Hexachlorobutadiene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Methylene Chloride	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Tetrachloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,1,2-Tetrachloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,2,2-Tetrachloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2,3-Trichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2,4-Trichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,1-Trichloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,2-Trichloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Trichloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Trichlorofluoromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2,3-Trichloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Vinyl Chloride	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0

ND: Not detected at the indicated reporting limit.

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BASELINE ON-SITE ANALYSIS™

Baseline On-Site Analysis
P. O. Box 2243
Huntington Beach, CA 92647

Toll Free: 888.753.7553
FAX: 714.840.1584

Laboratory Report

Client: FREY Environmental, Inc.
Client Address: 2817-A Lafayette Avenue
Newport Beach, California 92663

Report Date: 12/31/03
Lab Project Number: 03386
Client Project Number: 485-01

Project Name: AG PARK
Project Address: ---

Contact: Evan Privett

Dates Sampled: 12/15-16/03
Dates Received: 12/15-16/03
Dates Analyzed: 12/15-16/03
Sample Matrix: Vapor

Volatile Organic Compounds (EPA 8260B) - Part I

EPA Method:	8260B	8260B	8260B	8260B	8260B	8260B
Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Dilution Factor:	1	1	1	1	1	1
Sample ID:	**SG-89**	**SG-69**	**SG-42**	**SG-100**	**SG-46**	**SG-62**
Compound Name						
Volatile Aromatics (BTEX)						
Benzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Toluene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Ethylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Total Xylenes	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Fuel Oxygenates						
Methyl t-Butyl Ether (MTBE)	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
t-Butanol (TBA)	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
Di-Isopropyl Ether (DIPE)	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Ethyl t-Butyl Ether (ETBE)	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
t-Amyl Methyl Ether (TAME)	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Non-Halogenated VOC's						
n-Butylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
sec-Butylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
tert-Butylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Isopropylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
p-isopropyltoluene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Naphthalene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
n-Propylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Styrene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2,4-Trimethylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,3,5-Trimethylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Halogenated VOC's (HVOC's)						
Bromobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Bromochloromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Bromoform	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Bromomethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Carbon Tetrachloride	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
2-Chlorotoluene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
4-Chlorotoluene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Chlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Chloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Chloroform	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Chloromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0

ND: Not detected at the indicated reporting limit.

ED_005263_00001892-00012

BASELINE ON-SITE ANALYSIS™

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P. O. Box 2243
Huntington Beach, CA 92647

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Laboratory Report

Client: FREY Environmental, Inc.
Client Address: 2817-A Lafayette Avenue
Newport Beach, California 92663

Project Name: AG PARK
Project Address: ---

Contact: Evan Privett

Report Date: 12/31/03
Lab Project Number: 03386
Client Project Number: 485-01

Dates Sampled: 12/15-16/03
Dates Received: 12/15-16/03
Dates Analyzed: 12/15-16/03
Sample Matrix: Vapor

Volatile Organic Compounds (EPA 8260B) - Part II

EPA Method:	8260B	8260B	8260B	8260B	8260B	8260B
Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Dilution Factor:	1	1	1	1	1	1
Sample ID:	**SG-89**	**SG-69**	**SG-42**	**SG-100**	**SG-46**	**SG-62**
Compound Name						
HVOC's, continued						
Dibromochloromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dibromo-3-Chloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dibromomethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,3-Dichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,4-Dichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Dichlorodifluoromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1-Dichloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dichloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1-Dichloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
cis-1,2-Dichloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
trans-1,2-Dichloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dichloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,3-Dichloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
2,2-Dichloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1-Dichloropropene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Hexachlorobutadiene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Methylene Chloride	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Tetrachloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,1,2-Tetrachloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,2,2-Tetrachloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2,3-Trichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2,4-Trichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,1-Trichloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,2-Trichloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Trichloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Trichlorofluoromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2,3-Trichloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Vinyl Chloride	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0

ND: Not detected at the indicated reporting limit.

ED_005263_00001892-00013

BASELINE ONSITE ANALYSIS™

Baseline On-Site Analysis
P. O. Box 2243
Huntington Beach, CA 92647

Toll Free: 888.753.7553
FAX: 714.840.1584

Laboratory Report

Client: FREY Environmental, Inc.
Client Address: 2817-A Lafayette Avenue
Newport Beach, California 92663

Project Name: AG PARK
Project Address: ---

Contact: Evan Privett

Report Date: 12/31/03
Lab Project Number: 03386
Client Project Number: 485-01

Dates Sampled: 12/15-16/03
Dates Received: 12/15-16/03
Dates Analyzed: 12/15-16/03
Sample Matrix: Vapor

Volatile Organic Compounds (EPA 8260B) - Part I

EPA Method:	8260B	8260B	8260B	8260B	8260B	8260B
Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Dilution Factor:	1	1	1	1	1	1
Sample ID:	**SG-50**	**SG-181**	**SG-82**	**SG-84**	**SG-178**	**SG-170**
Compound Name						
Volatile Aromatics (BTEX)						
Benzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Toluene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Ethylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Total Xylenes	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Fuel Oxygenates						
Methyl t-Butyl Ether (MTBE)	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
t-Butanol (TBA)	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
Di-isopropyl Ether (DIPE)	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Ethyl t-Butyl Ether (ETBE)	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
t-Amyl Methyl Ether (TAME)	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Non-Halogenated VOC's						
n-Butylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
sec-Butylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
tert-Butylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Isopropylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
p-isopropyltoluene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Naphthalene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
n-Propylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Styrene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2,4-Trimethylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,3,5-Trimethylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Halogenated VOC's (HVOC's)						
Bromobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Bromochloromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Bromoform	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Bromomethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Carbon Tetrachloride	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
2-Chlorotoluene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
4-Chlorotoluene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Chlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Chloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Chloroform	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Chloromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0

ND: Not detected at the indicated reporting limit.

ED_005263_00001892-00014

BASELINE ON-SITE ANALYSIS

Baseline On-Site Analysis
P. O. Box 2243
Huntington Beach, CA 92647

Toll Free: 888.753.7553
FAX: 714.840.1584

Laboratory Report

Client: FREY Environmental, Inc.
Client Address: 2817-A Lafayette Avenue
Newport Beach, California 92663

Report Date: 12/31/03
Lab Project Number: 03386
Client Project Number: 485-01

Project Name: AG PARK
Project Address: ---

Contact: Evan Privett

Dates Sampled: 12/15-16/03
Dates Received: 12/15-16/03
Dates Analyzed: 12/15-16/03
Sample Matrix: Vapor

Volatile Organic Compounds (EPA 8260B) - Part II

EPA Method:	8260B	8260B	8260B	8260B	8260B	8260B
Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Dilution Factor:	1	1	1	1	1	1
Sample ID:	**SG-50**	**SG-181**	**SG-82**	**SG-84**	**SG-178**	**SG-170**
Compound Name						
HVOC's, continued						
Dibromochloromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dibromo-3-Chloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dibromomethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,3-Dichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,4-Dichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Dichlorodifluoromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1-Dichloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dichloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1-Dichloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
cis-1,2-Dichloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
trans-1,2-Dichloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dichloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,3-Dichloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
2,2-Dichloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1-Dichloropropene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Hexachlorobutadiene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Methylene Chloride	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Tetrachloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,1,2-Tetrachloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,2,2-Tetrachloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2,3-Trichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2,4-Trichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,1-Trichloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,2-Trichloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Trichloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Trichlorofluoromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2,3-Trichloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Vinyl Chloride	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0

ND: Not detected at the indicated reporting limit.

ED_005263_00001892-00015

BASELINE ENVIRONMENTAL ANALYSIS

Baseline On-Site Analysis
P. O. Box 2243
Huntington Beach, CA 92647

Toll Free: 888.753.7553
FAX: 714.840.1584

Laboratory Report

Client: FREY Environmental, Inc.
Client Address: 2817-A Lafayette Avenue
Newport Beach, California 92663

Project Name: AG PARK
Project Address: ---

Contact: Evan Privett

Report Date: 12/31/03
Lab Project Number: 03386
Client Project Number: 485-01

Dates Sampled: 12/15-16/03
Dates Received: 12/15-16/03
Dates Analyzed: 12/15-16/03
Sample Matrix: Vapor

Volatile Organic Compounds (EPA 8260B) - Part I

EPA Method:	8260B	8260B	8260B	8260B	8260B	8260B
Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Dilution Factor:	1	1	1	1	1	1
Sample ID:	**SG-118**	**SG-136**	**SG-149**	**SG-158**	**SG-148**	**SG-147**
Compound Name						
Volatile Aromatics (BTEX)						
Benzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Toluene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Ethylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Total Xylenes	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Fuel Oxygenates						
Methyl t-Butyl Ether (MTBE)	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
t-Butanol (TBA)	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10
Di-Isopropyl Ether (DIPE)	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Ethyl t-Butyl Ether (ETBE)	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
t-Amyl Methyl Ether (TAME)	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0
Non-Halogenated VOC's						
n-Butylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
sec-Butylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
tert-Butylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Isopropylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
p-isopropyltoluene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Naphthalene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
n-Propylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Styrene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2,4-Trimethylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,3,5-Trimethylbenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Halogenated VOC's (HVOC's)						
Bromobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Bromochloromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Bromoform	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Bromomethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Carbon Tetrachloride	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
2-Chlorotoluene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
4-Chlorotoluene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Chlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Chloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Chloroform	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Chloromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0

ND: Not detected at the indicated reporting limit.

ED_005263_00001892-00016

BASELINE ANALYSIS
Baseline On-Site Analysis
P. O. Box 2243
Huntington Beach, CA 92647
Toll Free: 888.753.7553
FAX: 714.840.1584

Laboratory Report

Client: FREY Environmental, Inc.
Client Address: 2817-A Lafayette Avenue
Newport Beach, California 92663

Report Date: 12/31/03
Lab Project Number: 03386
Client Project Number: 485-01

Project Name: AG PARK
Project Address: ---

Contact: Evan Privett

Dates Sampled: 12/15-16/03
Dates Received: 12/15-16/03
Dates Analyzed: 12/15-16/03
Sample Matrix: Vapor

Volatile Organic Compounds (EPA 8260B) - Part II

EPA Method:	8260B	8260B	8260B	8260B	8260B	8260B
Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Dilution Factor:	1	1	1	1	1	1
Sample ID:	**SG-118**	**SG-136**	**SG-149**	**SG-158**	**SG-148**	**SG-147**
Compound Name						
HVOC's, continued						
Dibromochloromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dibromo-3-Chloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dibromomethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,3-Dichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,4-Dichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Dichlorodifluoromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1-Dichloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dichloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1-Dichloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
cis-1,2-Dichloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
trans-1,2-Dichloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2-Dichloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,3-Dichloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
2,2-Dichloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1-Dichloropropene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Hexachlorobutadiene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Methylene Chloride	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Tetrachloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,1,2-Tetrachloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,2,2-Tetrachloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2,3-Trichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2,4-Trichlorobenzene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,1-Trichloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,1,2-Trichloroethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Trichloroethene	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Trichlorofluoromethane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
1,2,3-Trichloropropane	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
Vinyl Chloride	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0

ND: Not detected at the indicated reporting limit.

ED_005263_00001892-00017

BASELINE ON-SITE ANALYSIS

Baseline On-Site Analysis
P. O. Box 2243
Huntington Beach, CA 92647

Toll Free: 888.753.7553
FAX: 714.840.1584

Laboratory Report

Client: FREY Environmental, Inc.
Client Address: 2817-A Lafayette Avenue
Newport Beach, California 92663

Project Name: AG PARK
Project Address: ---

Contact: Evan Privett

Report Date: 12/31/03
Lab Project Number: 03386
Client Project Number: 485-01

Dates Sampled: 12/15-16/03
Dates Received: 12/15-16/03
Dates Analyzed: 12/15-16/03
Sample Matrix: Vapor

Volatile Organic Compounds (EPA 8260B) - Part I

EPA Method:	8260B
Units:	µg/L
Dilution Factor:	1
Sample ID:	**Method Blank**
Compound Name	
Volatile Aromatics (BTEX)	
Benzene	ND<1.0
Toluene	ND<1.0
Ethylbenzene	ND<1.0
Total Xylenes	ND<1.0
Fuel Oxygenates	
Methyl t-Butyl Ether (MTBE)	ND<1.0
t-Butanol (TBA)	ND<10
Di-Isopropyl Ether (DIPE)	ND<2.0
Ethyl t-Butyl Ether (ETBE)	ND<2.0
t-Amyl Methyl Ether (TAME)	ND<2.0
Non-Halogenated VOC's	
n-Butylbenzene	ND<1.0
sec-Butylbenzene	ND<1.0
tert-Butylbenzene	ND<1.0
Isopropylbenzene	ND<1.0
p-isopropyltoluene	ND<1.0
Naphthalene	ND<1.0
n-Propylbenzene	ND<1.0
Styrene	ND<1.0
1,2,4-Trimethylbenzene	ND<1.0
1,3,5-Trimethylbenzene	ND<1.0
Halogenated VOC's (HVOC's)	
Bromobenzene	ND<1.0
Bromochloromethane	ND<1.0
Bromoform	ND<1.0
Bromomethane	ND<1.0
Carbon Tetrachloride	ND<1.0
2-Chlorotoluene	ND<1.0
4-Chlorotoluene	ND<1.0
Chlorobenzene	ND<1.0
Chloroethane	ND<1.0
Chloroform	ND<1.0
Chloromethane	ND<1.0

ND: Not detected at the indicated reporting limit.

ED_005263_00001892-00018

BASELINE ON-SITE ANALYSIS™

Baseline On-Site Analysis
P. O. Box 2243
Huntington Beach, CA 92647

Toll Free: 888.753.7553
FAX: 714.840.1584

Laboratory Report

Client: FREY Environmental, Inc.
Client Address: 2817-A Lafayette Avenue
Newport Beach, California 92663

Project Name: AG PARK
Project Address: ---

Contact: Evan Privett

Report Date: 12/31/03
Lab Project Number: 03386
Client Project Number: 485-01

Dates Sampled: 12/15-16/03
Dates Received: 12/15-16/03
Dates Analyzed: 12/15-16/03
Sample Matrix: Vapor

Volatile Organic Compounds (EPA 8260B) - Part II

EPA Method:	8260B
Units:	µg/L
Dilution Factor:	1
Sample ID:	**Method Blank**
Compound Name	
HVOC's, continued	
Dibromochloromethane	ND<1.0
1,2-Dibromo-3-Chloropropane	ND<1.0
1,2-Dibromomethane	ND<1.0
1,2-Dichlorobenzene	ND<1.0
1,3-Dichlorobenzene	ND<1.0
1,4-Dichlorobenzene	ND<1.0
Dichlorodifluoromethane	ND<1.0
1,1-Dichloroethane	ND<1.0
1,2-Dichloroethane	ND<1.0
1,1-Dichloroethene	ND<1.0
cis-1,2-Dichloroethene	ND<1.0
trans-1,2-Dichloroethene	ND<1.0
1,2-Dichloropropane	ND<1.0
1,3-Dichloropropane	ND<1.0
2,2-Dichloropropane	ND<1.0
1,1-Dichloropropene	ND<1.0
Hexachlorobutadiene	ND<1.0
Methylene Chloride	ND<1.0
Tetrachloroethene	ND<1.0
1,1,1,2-Tetrachloroethane	ND<1.0
1,1,2,2-Tetrachloroethane	ND<1.0
1,2,3-Trichlorobenzene	ND<1.0
1,2,4-Trichlorobenzene	ND<1.0
1,1,1-Trichloroethane	ND<1.0
1,1,2-Trichloroethane	ND<1.0
Trichloroethene	ND<1.0
Trichlorofluoromethane	ND<1.0
1,2,3-Trichloropropane	ND<1.0
Vinyl Chloride	ND<1.0

ND: Not detected at the indicated reporting limit.

BASELINE ENVIRONMENTAL ANALYSIS

Baseline On-Site Analysis
P. O. Box 2243
Huntington Beach, CA 92647

Toll Free: 888.753.7553
FAX: 714.840.1584

Laboratory Report

Client: FREY Environmental, Inc.
Client Address: 2817-A Lafayette Avenue
Newport Beach, California 92663

Project Name: AG PARK
Project Address: ---

Contact: Evan Privett

Report Date: 12/31/03
Lab Project Number: 03386
Client Project Number: 485-01

Dates Sampled: 12/15-16/03
Dates Received: 12/15-16/03
Dates Analyzed: 12/15-16/03
Sample Matrix: Vapor

Quality Control Summary

Analytes	MS Recovery (%)	MSD Recovery (%)	RPD (%)	QC Sample
EPA 8260B				
1,1-Dichloroethene	95	101	6	LCS/LCSD
Benzene	95	100	5	LCS/LCSD
Trichloroethene	94	104	10	LCS/LCSD
Toluene	96	101	5	LCS/LCSD
Chlorobenzene	93	102	9	LCS/LCSD
EPA 8260B				
1,1-Dichloroethene	98	92	6	LCS/LCSD
Benzene	98	90	9	LCS/LCSD
Trichloroethene	97	92	5	LCS/LCSD
Toluene	94	91	3	LCS/LCSD
Chlorobenzene	96	93	3	LCS/LCSD
Acceptable QC Limits:	(65-135)	(65-135)	(0-30)	

MS: Matrix Spike; MSD: Matrix Spike Duplicate; RPD: Relative Percent Difference
LCS/LCSD: Lab Control Sample/Duplicate

ED_005263_00001892-00020

FREY Environmental, Inc.	Project Name: AG PARK
2817-A Lafayette Avenue	Project Address: ---
Newport Beach, California 92663	---
Phone:949.723.1645; FAX: 949.723.1854	Project Number: 485-01
Contact: Evan Privett	

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Laboratory Project #: **03386**

Sample ID	Sample Location	Date	Time	Lab ID	Soil (S), Water (W), Air (A)	Analysis: VOC's (8260B)	Number of Containers	Comments
SG-132		15-Dec-03	0835	1	V	X	1	
SG-185		15-Dec-03	0901	2	V	X	1	
SG-110		15-Dec-03	0930	3	V	X	1	
SG-116		15-Dec-03	1015	4	V	X	1	
SG-105		15-Dec-03	1036	5	V	X	1	
SG-112		15-Dec-03	1045	6	V	X	1	
SG-89		15-Dec-03	1111	7	V	X	1	
SG-69		15-Dec-03	1128	8	V	X	1	
SG-42		15-Dec-03	1152	9	V	X	1	
SG-100		15-Dec-03	1215	10	V	X	1	
SG-46		15-Dec-03	1256	11	V	X	1	
SG-62		15-Dec-03	1323	12	V	X	1	
SG-50		15-Dec-03	1334	13	V	X	1	
SG-181		15-Dec-03	1350	14	V	X	1	
SG-82		15-Dec-03	1408	15	V	X	1	
SG-84		15-Dec-03	1228	16	V	X	1	
SG-178		15-Dec-03	1446	17	V	X	1	
SG-170		15-Dec-03	1500	18	V	X	1	
SG-118		15-Dec-03	1517	19	V	X	1	
SG-136		16-Dec-03	0835	20	V	X	1	
SG-149		16-Dec-03	0859	21	V	X	1	
SG-158		16-Dec-03	0921	22	V	X	1	
SG-148		16-Dec-03	0950	23	V	X	1	
SG-147		16-Dec-03	1010	24	V	X	1	

Turnaround Time: On-Site Mobile Laboratory; samples were collected on the date(s)/times shown above.

Sample Condition: Chilled? Y / N Sealed? Y / N Comments:

Collected by Brian Kato
Date/Times shown above
signature: x Brian K Kato
of Baseline Analytical Services

Special Instructions:

BASELINE ENVIRONMENTAL ANALYSIS LABORATORY
P. O. Box 2243
Huntington Beach, California 92647
Phone: (888) 753-7553
FAX: (714) 840-1584

APPENDIX B

BACKGROUND METAL CONCENTRATIONS
LETTER DATED NOVEMBER 14, 2005

FREY

FREY ENVIRONMENTAL, INC.

Environmental Geologists, Engineers, Assessors

2817 A Lafayette Avenue
Newport Beach, CA 92663
(949) 723-1645
Fax (949) 723-1854
Email: freyinc@freyinc.com

November 14, 2005
485-01

Maryam Tasnif-Abbasi
Department of Toxic Substance Control
5796 Corporate Avenue
Cypress, CA 90630

Re: Background Metal Concentrations
Former Agricultural Park
7020 Crest Avenue
Riverside, California

Dear Ms. Tasnif-Abbasi:

This letter presents a summary table of metal concentrations for selected soil samples collected from the former Agriculture Park (Site, Figure 1). The soil sample data has been summarized in Table 1 and the locations presented graphically on Figure 2.

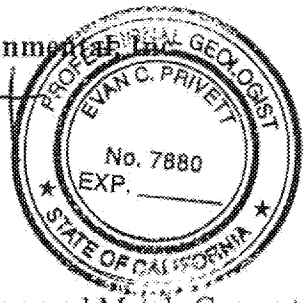
The data presented in Table 1 was presented in a November 2, 2005 email transmitted by Bryan Eya of the Department of Toxic Substance Control. The November 2, 2005 transmittal suggested that the highest concentrations of individual metals showed in Mr. Eya's table could be used for background metal concentrations. Soil samples selected to represent background concentrations are typically located away from the area of impact or former site operations. The soil samples listed in Table 1 represent locations on the Site which are away from the former sewage plant operations. Soil samples collected from trench pits TP2, TP4, TP42, TP45 and from boring B-16 are located near the Site property line. Soil samples collected from borings B-15 and B-17 are located in the southeastern portion of the Site away from former sewer plant operations.

A total of 57 soil samples collected from locations throughout the Site were analyzed for Title 22 metals. An additional 25 soil samples collected from locations throughout the Site were analyzed for arsenic. Based on the extensive amount of metals sampling previously conducted at the Site, it is our understanding that no additional soil samples will be required to be analyzed for metals. We further understand that given the low concentrations, metals will not be carried through the human health risk assessment as a driver toward overall risk or cleanup levels.

Please confirm that given the metals testing done at the Site, (1) the highest concentrations for each metal contained in the table will be the official "site specific" background level for each metal (2) no additional metals testing will be required, and (3) that the metals concentrations will not be carried through the human health risk assessment.

Please contact me with any questions at (949) 723-1645 extension 112.

Sincerely,
FREY Environmental Inc.



Evan Privett
PG #7880

Attachments
Table 1 - Background Metals Concentrations
Figure 1 - Site Location Map
Figure 2 - Site Sketch Showing Soil Sample Locations for Background Metals

cc: Chuck Cox
Friends of the Riverside Airport LLC
8175 Limonite Avenue
Riverside, California 92509

John Wactor
Wactor & Wactor LLP
180 Grand Avenue, Suite 950
Oakland, CA 94612

TABLE 1
BACKGROUND METAL CONCENTRATIONS

FORMER AGRICULTURAL PARK
7020 CREST AVENUE
RIVERSIDE, CALIFORNIA

All concentrations in milligrams per kilogram (mg/kg)

Sample Designation	Sample Depth (feet)	Sb	As	Ba	Be	Cd	Cr	Co	Cu	Pb	Hg	Mo	Ni	Se	Ag	Tl	V	Zn
B-15	0.75	ND<1.0	1.33	94.9	ND<0.5	ND<0.5	23.9	7.11	13.9	5.28	ND<0.1	ND<5.0	14.5	ND<1.0	ND<1.0	ND<1.0	45.6	40.4
B-15	3.0	ND<1.0	1.67	175	ND<0.5	ND<0.5	16.1	4.56	4.34	1.16	ND<0.1	ND<5.0	5.82	ND<1.0	ND<1.0	ND<1.0	48.2	39.4
B-16	3.0	ND<1.0	0.502	121	ND<0.5	ND<0.5	21.0	5.61	14.1	5.55	ND<0.1	ND<5.0	12.8	ND<1.0	ND<1.0	ND<1.0	42.8	42.2
B-17	0.75	ND<1.0	ND<0.5	96.3	ND<0.5	ND<0.5	20.9	7.53	11.7	3.06	ND<0.1	ND<5.0	13.0	ND<1.0	ND<1.0	ND<1.0	43.0	43.4
B-17	3.0	ND<1.0	ND<0.5	98.1	ND<0.5	ND<0.5	17.1	6.88	9.31	2.50	ND<0.1	ND<5.0	11.4	ND<1.0	ND<1.0	ND<1.0	34.8	37.0
TP2	0.5	ND<0.750	5.6	163	0.627	ND<0.5	27.5	13.0	19.2	11.2	ND<0.0835	ND<0.250	16.7	ND<0.750	ND<0.250	ND<0.750	53.0	48.1
TP4	0.5	ND<0.750	1.39	108	0.398	ND<0.5	14.3	8.73	10.3	4.32	ND<0.0835	ND<0.250	8.59	ND<0.750	ND<0.250	ND<0.750	33.4	26.1
TP42	0.5	ND<0.750	3.26	146	0.643	ND<0.5	24.6	12.5	21.6	11.6	ND<0.0835	ND<0.250	17.3	ND<0.750	ND<0.250	ND<0.750	41.6	48.3
TP45	0.5	ND<0.750	2.49	133	0.493	ND<0.5	18.3	10.1	18.6	11	ND<0.0835	ND<0.250	13.2	ND<0.750	ND<0.250	ND<0.750	35.5	42.7
Background Concentration			5.6	175	0.643		24.6	12.5	21.6	11.6			17.3				53.0	48.3

Sb	Antimony	Co	Cobalt	Se	Selenium
As	Arsenic	Cu	Copper	Ag	Silver
Ba	Barium	Pb	Lead	Tl	Thallium
Be	Beryllium	Hg	Mercury	V	Vanadium
Cd	Cadmium	Mo	Molybdenum	Zn	Zinc
Cr	Chromium	Ni	Nickel		

Highlighted results will be used as site specific background concentrations.

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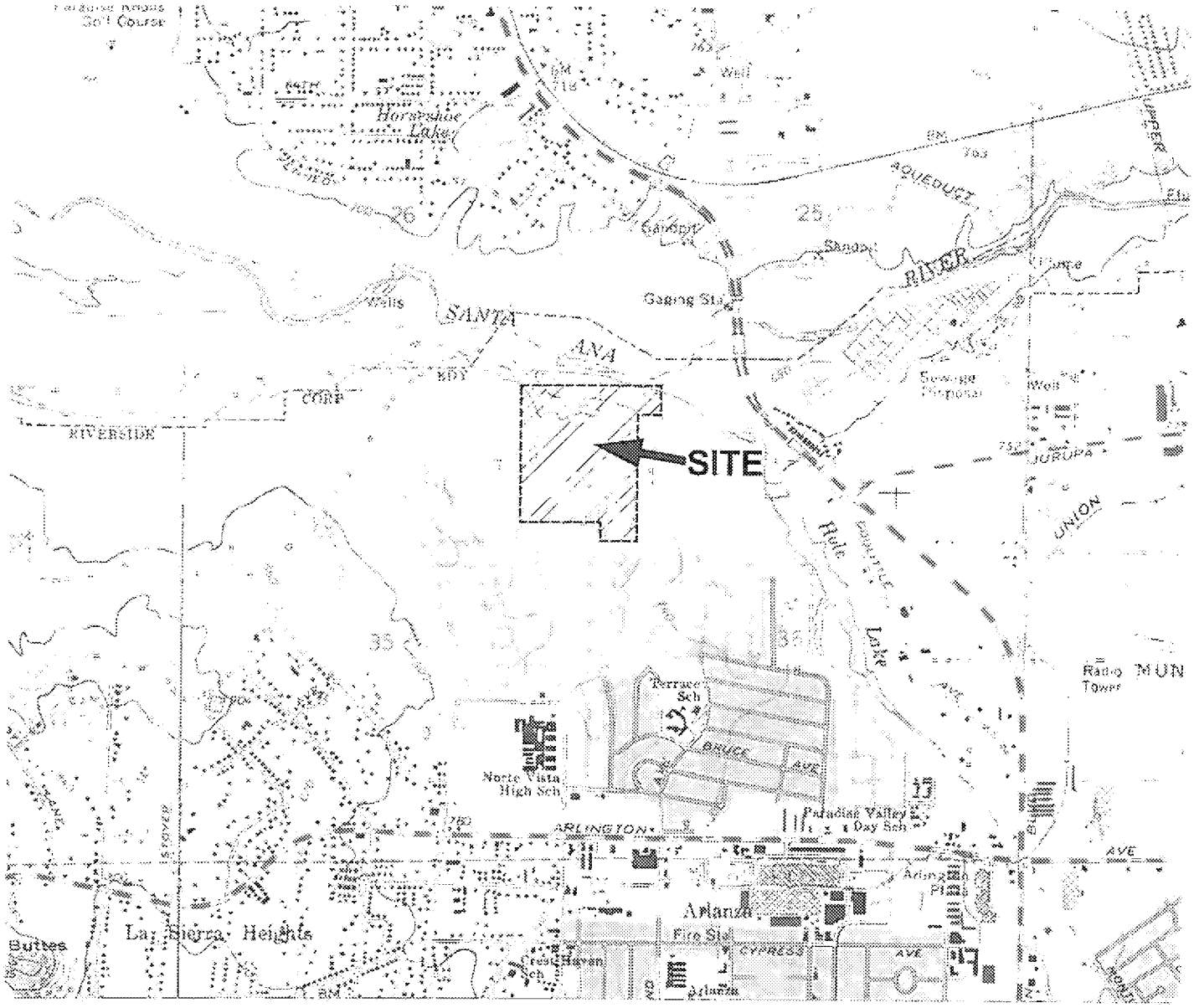


NORTH

0 1/2 1

SCALE IN MILES

AGRICULTURAL PARK
RIVERSIDE, CALIFORNIA

Client: FRIENDS OF THE RIVERSIDE AIRPORT LLC

Project No.: 485-01

FREY ENVIRONMENTAL, INC.

NOTE:

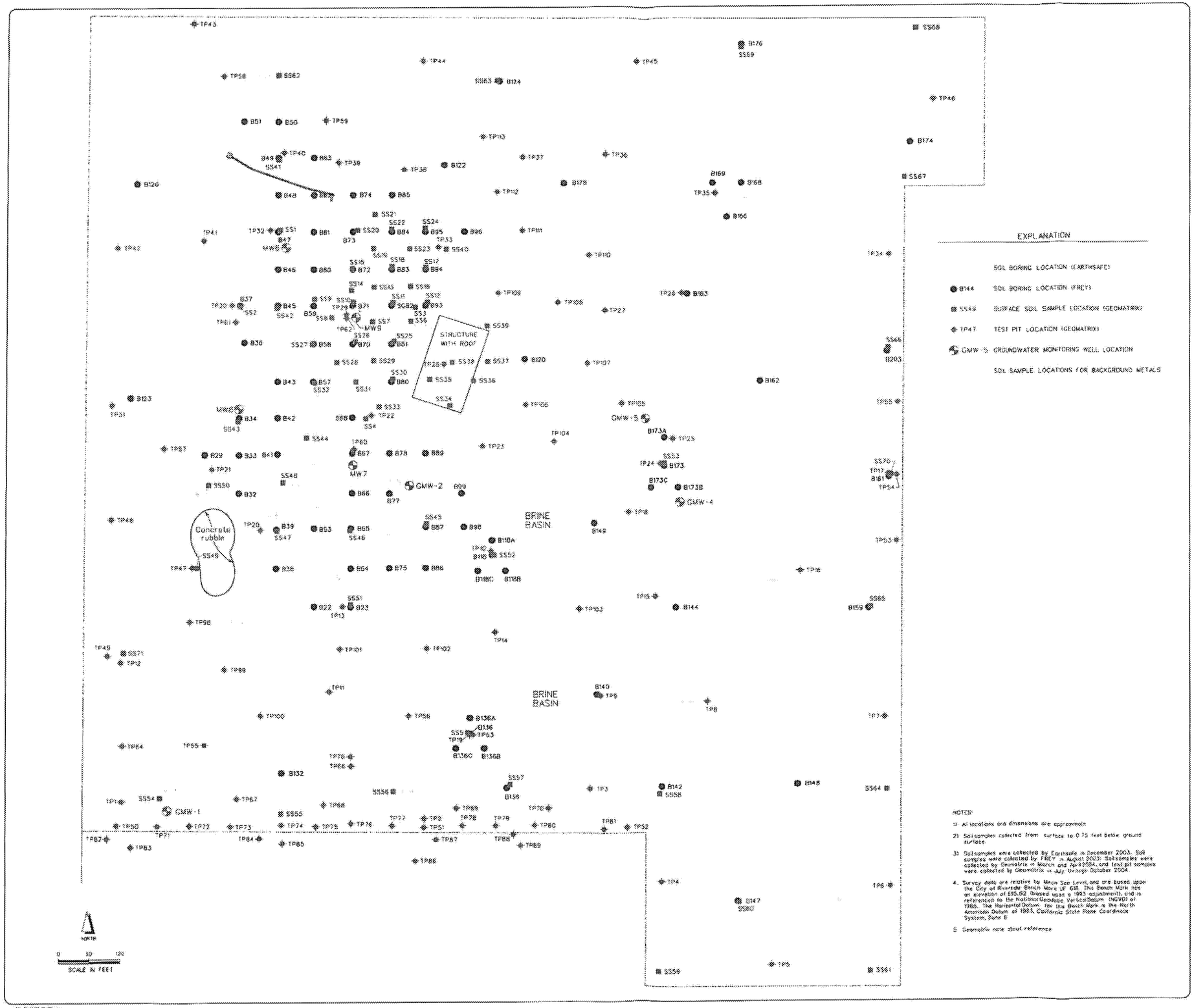
1) All locations and dimensions are approximate.
2) Base map from USGS 7.5 minute California topographic quadrangle, printed from Topo.

SITE LOCATION MAP

Date: AUGUST 2005

Figure: 1

ED_005263_00001892-00026



EXPLANATION

- SOIL BORING LOCATION (EARTHSAFE)
- B144 SOIL BORING LOCATION (FREY)
- SS48 SURFACE SOIL SAMPLE LOCATION (GEOMATRIX)
- TP47 TEST PIT LOCATION (GEOMATRIX)
- GMW-5 GROUNDWATER MONITORING WELL LOCATION
- SOIL SAMPLE LOCATIONS FOR BACKGROUND METALS

NOTES:

1) All locations and dimensions are approximate.

2) Soil samples collected from surface to 0.75 feet below ground surface.

3) Soil samples were collected by Earthsafe in December 2003. Soil samples were collected by FREY in August 2003. Soil samples were collected by Geomatrix in March and April 2004, and test pit samples were collected by Geomatrix in July through October 2004.

4. Survey data are relative to Mean Sea Level, and are based upon the City of Riverside Bench Mark 'LF 638'. This Bench Mark has an elevation of 885.62 (based upon a 1983 adjustment), and is referenced to the National Geodetic Vertical Datum (NGVD) of 1985. The Horizontal Datum for this Bench Mark is the North American Datum of 1983, California State Plane Coordinate System, Zone 6.

5) Geomatrix note about reference.

REVISIONS	BY

CLIENT
FREDERIC R. FREY
RIVERSIDE AIRPORT, LLC

SITE SKETCH
SHOWING SOIL SAMPLE LOCATIONS
FOR BACKGROUND METALS

AGUANGA TURN, PARK
RIVERSIDE, CALIFORNIA

FREY ENVIRONMENTAL, INC.
2817 A LAFAYETTE AVE.
NEWPORT BEACH, CA 92663
(949) 723-9645

DRAWN	WF
CHECKED	SD
DATE	NOVEMBER, 2005
SCALE	AS SHOWN
JOB NO	485-01

Figure 2

485-01/485d01 2fig.dgn

ED_005263_00001892-00027

APPENDIX C

NEPTUNE AND COMPANY, INC. MEMORANDUM DATED OCTOBER 17, 2003

FREY

NEPTUNE AND COMPANY, INC.
2031 Kerr Gulch Road
Evergreen, CO 80439
Phone: (720) 746-1803
Fax: (720) 746-1605

MEMORANDUM

From: Paul Black and Kelly Black

To: Evan Privett, Frey Environmental

Date: 17 October 2003

Subject: Sample size calculations for the Riverside site.

This memorandum documents assumptions and calculations for sample size determination for the Riverside site based on information provided in the FAX that we received yesterday (16 October 2003) and further details provided in our telephone call, also yesterday.

The sample size calculations are made using a fairly simple formula. The basis for the calculations is a non-parametric Classical statistics hypothesis test. This test is based on comparing an average concentration to the PCB threshold concentration of 0.22 ppm. Inputs required to complete the calculations include an estimate of variance (of the site concentrations of PCBs), a desired significance level, and desired power of the test that must be specified at a concentration of interest. The point of raising this is that these inputs should be provided by the stakeholders. We can estimate variance based on the data provided, but we are not in a position to decide on the significance level or power of the test.

To clarify, the significance level of the test is interpreted as the tolerance for making a decision error – in this case declaring the average site concentration as less than the threshold when it is in fact greater. This is often termed the Type I error. The power of the test is the complement of the other type of decision error, termed the Type II error (power = 1 – Type II error). Type II error must be specified at a given concentration less than the threshold. A Type II error occurs when the average site concentration is declared greater than the threshold when it is in fact less than the threshold. Obviously, the further away from the threshold Type II error is specified the smaller should be the willingness to make a decision error. In both cases tolerance for making a decision error is measured on a probability scale.

These types of decision errors can occur because we sample the site rather than take a census. Sampling does not always provide the correct answer, but the more samples we take the more likely we are to be correct. The sample size calculation deals with trade offs between tolerance for decision errors and costs of taking samples. For example, as the tolerance for making a

decision error decreases, the sample size should increase because we are less willing to be wrong.

We have made assumptions regarding Type I and Type II error tolerances, and the point at which the Type II error is specified. We have varied these values to some extent to show how sample size changes with the changes in assumptions. This will provide you with some idea of the consequences of relaxing error tolerances. Error tolerances should, however, be specified according to the importance of the decisions that are being made. In this case, there is some desire to build residences on this land, meaning that there is good reason to ensure that the site is not declared "clean" when in fact it is not. Hence the Type I error or significance level should be fairly small. There is also probably some desire on the part of the responsible parties (e.g., developers) to make sure that remediation is not performed unnecessarily, so that the Type II error tolerance should not be too large (depending on the average concentration at which it is specified). Specification of these error terms should be performed by the stakeholders or by the project team.

The basic formula used for calculation of sample size is often used or cited by EPA. It is based on a non-parametric test (the Wilcoxon signed rank test), and on simulation studies performed by Pacific Northwest National Laboratories that formed the basis for an approximate formula that is based on the normal distribution. Essentially, the formula is the one that would be used if a normal-based test was being performed, but an adjustment is made (multiply by 1.16) to account for the intent to perform a non-parametric test. The formula is as follows:

$$n = 1.16\left[\frac{s^2}{\Delta^2}(z_{1-\alpha} + z_{1-\beta(\mu)})^2 + 0.5z_{1-\alpha}^2\right]$$

where,

n	is the number of samples
s	is the estimated standard deviation (of PCB concentrations)
Δ	is the width of the gray region (the difference between the point at which α is specified and the point at which β is specified)
α	significance level or Type I error tolerance
$\beta(\mu)$	Type II error tolerance
z	quantile from the standard normal distribution

This formula is based on a hypothesis test that specifies:

$H_o : \mu \geq 0.22 ppm\ PCB$

$H_a : \mu \leq 0.22 ppm\ PCB$

That is, the null hypothesis is that the mean concentration exceeds the threshold, and the alternative is that the mean does not exceed the threshold. The gray region is specified at one

end by the point at which α is specified, i.e., 0.22 ppm, and at the other end by a value of the mean (μ) at which the Type II error is specified.

That describes the basic mathematics, but there are other assumptions that are required to complete the calculations. There are some statistical assumptions for the underlying hypothesis testing procedure regarding independence (lack of spatial correlation) and symmetry that are usually difficult to verify up front, but this is commonly ignored for the purpose of sample size calculations (simplicity). There is also the issue that residential human health risk assessments are usually made on 1/8-acre areas (exposure units). In this case, the site is approximately 60 acres, but about 10 acres are not included in this analysis because a sub-area is considered contaminated at levels that are greater than the threshold, about 15 acres are discounted because the washes will not be developed, and about 5 acres comprise the lagoon and brine ponds for which the initial objectives are different. That leaves about 30 acres for development. So, we have assumed those areal distinctions and their associated areas. Obviously it is cost prohibitive to perform sample size calculations for each of the (approximately) 240 1/8-acre units, but this can be avoided by assumption that each 1/8-acre unit is statistically similar so that aggregation across the 30 acres is reasonable. Similar arguments can be made for the brine ponds and lagoon areas, which are subject to different immediate objectives, leading to a separate sampling plan for those areas (the areas of the brine ponds and lagoon have been lumped together for sample size determination).

The variance or standard deviation estimate was estimated from the available data from the 30 acres of interest (i.e., outside the contaminated area). Non-detects were treated as zero concentration because detection limits were not provided. However, inclusion of the data from B-18 caused significant problems in the estimation, both because those data points are outliers, implying that they come from a different population and because their inclusion has a profound effect on the variance and hence the sample size calculations (leading to very large numbers of samples). Note that the mean concentration including those values is greater than 0.22 ppm (in the 30-acre area), indicating that inclusion of data from B-18 implies that the average concentration is greater than the threshold anyway (i.e., the site is not clean enough to develop). To continue we have made the following assumptions: The data from B-18 are an aberration, and are not expected to occur, in which case their inclusion in variance estimation to support sample size calculations is not necessary; and, if further evidence is found of similar anomalies then some form of remediation or other risk management effort will be undertaken. Consequently, the variance estimate includes data from all boreholes outside of the digester area excluding B-18. This provides an estimate of the standard deviation of 0.07 ppm PCBs as shown in the Table below. Note that this value is used in the sample size calculations both for the 30-acre area and for the brine ponds and lagoon area, although there are no samples available from the latter. This again speaks to the issue of statistical similarity across areas. We also note that all of the data have been grouped together; that is, no distinction is made because of sampling depth. This seems reasonable given the data, and helps to provide a better estimate of the variance (or standard deviation).

	With B-18 Included	With B-18 Excluded

	Mean	Standard Deviation	Mean	Standard Deviation
All depths	0.32	0.87	0.07	0.07
9"	0.42	1.16	0.05	0.06
3'	0.23	0.48	0.08	0.08

The common default values to use for α and β are 5% and 20%, however, we note again that these values should be specified based on importance of the problem and relative importance of the two types of decision errors. These common defaults do not address the width of the gray region or, hence, the possible average concentration at which the Type II error is specified. In the tables that follow, various combinations of input values are used, including: values of α of 5%, 10% and 15%; values of β of 15%, 20%, and 25%; values of the standard deviation of 0.07 ppm and 0.14 ppm (the latter was used to give some idea of the consequences of increased standard deviation); and a gray region of width 10%, 20% and 30% of the action level. Note that as error rates increase, sample size decreases, as the size of the gray region increase, sample size decreases, and as variance increases sample size increases.

The following Table presents the results of the calculations under the conditions specified.

Number of Samples							
Threshold = 0.22 ppm PCBs		**α = 5%**		**α = 10%**		**α = 15%**	
		***s* = 0.14**	***s* = 0.07**	***s* = 0.14**	***s* = 0.07**	***s* = 0.14**	***s* = 0.07**
Δ = 0.022 ppm* (10%)	**β = 15%**	340	86	254	65	203	52
	β = 20%	292	75	213	54	167	43
	β = 25%	255	65	181	46	139	36
Δ = 0.044 ppm (20%)	**β = 15%**	86	23	65	17	52	14
	β = 20%	75	**20**	54	15	43	11
	β = 25%	65	18	46	13	36	10
Δ = 0.066 ppm (30%)	**β = 15%**	40	11	29	8	24	7
	β = 20%	34	10	25	7	20	6
	β = 25%	30	9	21	6	16	5

* When Δ = 0.022 ppm, the Type II error, β, is specified at 0.22 – 0.022 = 0.198 ppm, etc.

Choosing from among these or other options is not straightforward, since the number of samples should depend on input from the stakeholders or the project team. The bold number probably corresponds to the most common defaults that are used (α = 0.05, β=0.20), but we do not recommend the use of defaults; instead, we recommend that the project team consider the appropriate inputs. Also, consider the standard deviation that has been used.

If any one of these numbers is used, we recommend its use separately in the 30-acre area and in the combined brine ponds and lagoon area. The latter has not been sampled previously. Note that choice of 20 samples, implies about 10 bore holes in addition to those already drilled in both areas for a total of 20 additional bore holes. Random placement of the bore holes is also an assumption of the algorithm used. We recommend good spatial coverage rather than pure

random placement. This is common practice and is assumed to have little impact on the statistics, but considerable impact on common sense arguments for sampling coverage.

We have omitted the washes from this analysis, but performed a separate analysis for the washes by assuming a different threshold concentration. The different threshold was chosen because the receptor scenario is different. We assumed that a recreational scenario might be more appropriate for the washes, and that a threshold an order of magnitude greater than 0.22 might be a reasonable starting point. If a residential scenario is applied instead, then the number of samples presented above would be suggested (assuming statistical similarity across the washes as well as the 30-acre area). The following table shows the results of the analysis with the threshold value of 2.2 ppm.

Number of Samples							
Threshold = 2.2 ppm PCBs		**$\alpha = 5\%$**		**$\alpha = 10\%$**		**$\alpha = 15\%$**	
		$s = 0.14$	**$s = 0.07$**	**$s = 0.14$**	**$s = 0.07$**	**$s = 0.14$**	**$s = 0.07$**
$\Delta = 0.22$ ppm* (10%)	**$\beta = 15\%$**	5	3	4	2	3	2
	$\beta = 20\%$	5	3	4	2	3	2
	$\beta = 25\%$	5	3	3	2	2	1
$\Delta = 0.44$ ppm (20%)	**$\beta = 15\%$**	3	2	2	2	2	1
	$\beta = 20\%$	3	2	2	2	2	1
	$\beta = 25\%$	3	2	2	2	1	1
$\Delta = 0.66$ ppm (30%)	**$\beta = 15\%$**	2	2	2	2	1	1
	$\beta = 20\%$	2	2	2	2	1	1
	$\beta = 25\%$	2	2	2	2	1	1

*When $\Delta = 0.22$ ppm, the Type II error, β, is specified at 2.2 - .22 = 1.98 ppm, etc.

Clearly, in this case, not many samples are needed. We note that B-18 was actually collected in the eastern wash, in which case, it might be more reasonable to make some different assumptions regarding the variance. It might also be reasonable to consider different error tolerance for a recreational area.

APPENDIX D

HEALTH AND SAFETY PLAN

FREY

SAFETY, HEALTH, AND EMERGENCY RESPONSE

Cox Properties – Ag Park Project
Riverside, CA

April 18, 2006

TABLE OF CONTENTS
Cox Properties - Ag Park Project
Safety, Health, and Emergency Response

ED_005263_00001892-00036

ED_005263_00001892-00037

April 18, 2006

SITE SAFETY AND HEALTH PLAN

Cox Properties – Ag Park Project
Riverside, California

1.0 INTRODUCTION

This site safety and health plan (SSHP) sets forth the minimum safety and health, and emergency response requirements for activities involving, or potentially involving, employee exposure to safety and health hazards associated with the proposed site operations at the Cox Properties Remediation Project located at the Ag Park in Riverside, California ("the Site"; Figure 1). The planned field activities at the Site include the excavation, stockpiling, loading, off-site transportation, and disposal of material contaminated with elevated concentrations of Polychlorinated Biphenyls (PCB) by Waste Management, Inc. ("WMI") personnel.

If work plan specifications change during or after the preparation of this SSHP, or if site conditions differ as the result of more information, the WMI Health and Safety Director shall be informed immediately and appropriate changes shall be made to this SSHP.

At a minimum, all contractor/subcontractor personnel working on site must:

- have read and understood the specifications of this SSHP
- have completed all training requirements in 29 Code of Federal Regulations (CFR) 1910.120
- provide their own health and safety equipment as indicated in this SSHP, and comply with the minimum requirements established by this SSHP. If the contractor/subcontractor has prepared his/her own SSHP, it must minimally meet requirements contained herein and all applicable Federal, State, and local health and safety requirements.

This SSHP shall be read and approved by the WMI Health and Safety Director, and the WMI Project Manager.

ED_005263_00001892-00038

A copy of this SSHP shall be kept on site, easily accessible to all employees and project visitors, and another in WMI files.

This SSHP was prepared using the following documents:

* 29 CFR 1910 -- Occupational Safety and Health Standards, 1990
* 29 CFR 1926 -- Safety and Health Regulations for Construction
* 29 CFR 1910.1000 -- OSHA Air Contaminants - Permissible Exposure Limits, 1990
* Title 8, California Code of Regulations, Occupation Health and Safety Standards.
* American Conference of Governmental Industrial Hygienists (ACGIH). Threshold Limit Values and Biological Exposure Indices for 1990 - 1991. Cincinnati, Ohio, ACGIH.
* California Department of Health Services (DHS), Toxic Substances Control Division (TSCD), Technical and Support Unit, Region 3, Los Angeles, California, August 1988. Site Safety Plan Guidance Document.
* National Institute for Occupational Safety and Health (NIOSH); Occupational Safety and Health Administration (OSHA); U.S. Coast Guard (USCG); U.S. Environmental Protection Agency (EPA), October 1985. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities. Washington D.C.: U.S. Government Printing Office.
* NIOSH/OSHA, 1981. Occupational Health Guidelines for Chemical Hazards.
* Sax, N. Irving, 1984, Dangerous Properties of Materials, 6th edition, Van Nostrand Reinhold Company, Inc., New York, New York.
* U.S. EPA, Office of Emergency and Remedial Response, Hazardous Response Support Division, November 1984. Standard Operating Safety Guides.

ED_005263_00001892-00039

2.0 SITE CHARACTERISTICS

Site Name: Ag Park
Site Address: Jurupa Avenue & Van Buren Avenue
Riverside, California

2.1 Background

The Site was previously occupied by the City of Riverside as a municipal waste water treatment plant (WWTP).

Previous soil sampling activities conducted at the Site indicated that there are elevated concentrations of PCB in the soil and demolished WWTP concrete structures. Further, elevated levels of chlorinated dibenzo p dioxins (CDDs) and chlorinated dibenzofurans (CDFs) were noted in the soil samples.

ED_005263_00001892-00040

3.0 Work Description

Tasks to be performed at the Site include the excavation, stockpiling, loading, off-site transportation, and disposal of the impacted soil.

Work activities are planned in the following order (some activities may be performed concurrently):

- soil excavation/stockpiling
- loading off-site transport trucks
- off-site transportation
- soil disposal

4.0 KEY PERSONNEL AND RESPONSIBILITIES

4.1 WMI Site Safety Personnel

Name	Responsibilities
Rob Heller	Project Manager
George Vernaci	Site Safety Officer
George Vernaci	Health and Safety Director

4.2 WMI Personnel and Responsibilities

The responsibilities of the WMI personnel listed in Section 4.1 are outlined below.

4.2.1 WMI Project Manager

The WMI Project Manager, Rob Heller, has the ultimate responsibility for the health and safety of WMI personnel onsite. As part of his duties, Mr. Heller shall be responsible for:

- keeping the WMI Health and Safety Director informed of project developments

ED_005263_00001892-00041

- ensuring that onsite WMI personnel receive the proper training, and are informed of potential hazards anticipated at the Site and procedures and precautions to be implemented on the job

- ensuring that contractors and subcontractors are informed of the expected hazards and appropriate protective measures at the Site. (Subcontractors should also be given a copy of WMI's SSHP for review.)

- ensuring that resources are available to provide a safe and healthy work environment for WMI personnel.

4.2.2 WMI Health and Safety Director

The WMI Health and Safety Director, George Vernaci, shall be responsible for:

- monitoring the health and safety impacts of this project for onsite WMI personnel

- assessing the potential health and safety hazards at the Site

- recommending appropriate safeguards and procedures

- modifying the SSHP, when necessary

- approving changes in safeguards used or operating procedures employed at the Site.

The WMI Health and Safety Director shall have the authority to:

- require that additional safety precautions or procedures be implemented

- order an evacuation of the Site, or portion of the Site, or shut down any operation, if he believes a health or safety hazard exists

- deny unauthorized personnel access to the Site

- require that any worker obtain immediate medical attention

- approve or disallow any proposed modifications to safety precautions or working procedures.

ED_005263_00001892-00042

4.2.3 WMI Site Safety Officer

The WMI Site Safety Officer (SSO), George Vernaci, has fulfilled the 40-hour health and safety training requirements pursuant to 29 CFR 1910.120.

The SSO, or a trained designated alternate, will be present at the Site during work activities. The SSO shall be notified of and approve activities in which persons may be reasonably expected to be exposed to contaminated soils and/or groundwater.

The SSO shall be responsible for:

- ensuring that onsite WMI personnel comply with the requirements of the SSHP
- limiting access to the Site
- reporting unusual or potentially hazardous conditions to the WMI Health and Safety Director and the WMI Project Manager
- reporting injuries, exposures, or illnesses to the WMI Health and Safety Director and the WMI Project Manager
- communicating proposed changes in work scope or procedures to the WMI Health and Safety Director for approval
- recommending to the WMI Health and Safety Director and the WMI Project Manager additional safety procedures or precautions that might be implemented.

The SSO shall have the authority to:

- order an evacuation of the Site, or portion(s) of the Site, or shut down any operation if he believes a health or safety hazard exists
- deny site access to unauthorized personnel
- require that any worker, including the contractor's or subcontractor's personnel, obtain immediate medical attention.

ED_005263_00001892-00043

5.0 HAZARD ANALYSIS

Potential chemical, physical and general safety hazards during the field activities at the Site include the following:

- Chemical hazards
    - respiratory (exposure to fugitive dust)
    - respiratory and dermal (contact with PCB)
    - ingestion, respiratory and dermal (contact with CDDs and CDFs)
- Physical hazards
    - excavation instability
    - noise
    - electric shock
    - heavy equipment
    - heat stress
    - fire and explosion

Work procedures to protect workers from chemical and physical hazards are discussed in Section 6.0.

5.1 Chemical Hazards

The primary chemical hazards are Polychlorinated Biphenyls based on the laboratory analytical results of previous soil sampling conducted at the Site. Chlorinated dibenzo p dioxins and chlorinated dibenzofurans may also pose a threat. Inhalation exposures are the primary exposure pathway of concern. Dermal contact may aggravate health problems with prolonged exposure to CDDs and CDFs.

Description of the chemical of concern including physical and odor recognition characteristics, effects of short-term exposure for use in the field, and the Permissable Exposure Levels (PEL) (OSHA Standard 29 CFR 1910.1000) are presented below.

5.1.1 Chemical Description of Polychlorinated Biphenyls

Polychlorinated Biphenyls were used in many different types of products including hydraulic fluid, casting wax, pigments, carbonless copy paper, plasticizer, vacuum pumps, compressors, heat transfer systems and others. Their primary use, however, was as a dielectric fluid in

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electrical equipment. Because of their stability and resistance to thermal breakdown as well as their insulating properties they were the fluid of choice for transformers and capacitors.

Among the health affects of PCB's are skin ailments called chloracne, reproductive disorders, liver disease and others. PCB's are a suspected human carcinogen and a known animal carcinogen. They are resistant to degradation and therefore persist for many years in the environment. Furthermore, they bioaccumulate in the foodchain and are stored in the body fat of animals and humans.

Short-term exposure to PCBs may cause irritation to the skin, nose, throat, eyes and lungs. Long-term exposure may cause a burning feeling in the eyes, nose and face; lung and throat irritation; nausea; dizziness; and chemical acne. Liver damage and digestive disturbance have been reported in some individuals. PCBs may impair the function of the immune system.

- The TWA of the PEL for PCB is 1,000 $\mu g/m^3$ for PCBs containing 42% chlorine and 500 $\mu g/m^3$ for compounds containing 54% chlorine.

5.1.2 Chemical Description of Chlorinated Dibenzo p Dioxins

CDDs are a family of 75 chemically related compounds commonly known as chlorinated dioxins. One of these compounds, 2,3,7,8-TCDD, is one of the most toxic of the CDDs and is the one most studied. In the pure form, CDDs are crystals or colorless solids. CDDs enter the environment as mixtures containing a number of individual components. 2,3,7,8-TCDD is odorless; the odors of the other CDDs are not known.

CDDs are not intentionally manufactured by industry except for research purposes. They (mainly 2,3,7,8-TCDD) may be formed during the chlorine bleaching process at waste and drinking water treatment plants. They can occur as contaminants in the manufacture of certain organic chemicals, and are released into the air in emissions from municipal solid waste and industrial incinerators.

Exposure to CDDs may occur through:

- Breathing low levels in air and drinking low levels in water.
- Skin contact with certain pesticides and herbicides.
- Living near an uncontrolled hazardous waste site containing CDDs or incinerators releasing CDDs.

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- Working in industries involved in producing certain pesticides containing CDDs as impurities, working at paper and pulp mills, operating incinerators, or Working in soil contaminated with high levels of CDDs.

The most noted health effect in people exposed to large amounts of 2,3,7,8-TCDD is chloracne, a severe skin disease with acne-like lesions that occur mainly on the face and upper body. Other skin effects noted in people exposed to high doses of 2,3,7,8-TCDD include skin rashes, discoloration, and excessive body hair. Changes in blood and urine that may indicate liver damage also are seen in people. Exposure to high concentrations of CDDs may induce long-term alterations in glucose metabolism and subtle changes in hormonal levels.

In certain cases, 2,3,7,8-TCDD is especially harmful and can cause death after a single exposure. Exposure to lower levels can cause a variety of effects, such as weight loss, liver damage, and disruption of the endocrine system. In many cases, 2,3,7,8-TCDD weakens the immune system and causes a decrease in the system's ability to fight bacteria and viruses. In other studies, exposure to 2,3,7,8-TCDD has caused reproductive damage and birth defects. Some animal species exposed to CDDs during pregnancy had miscarriages and the offspring of animals exposed to 2,3,7,8-TCDD during pregnancy often had severe birth defects including skeletal deformities, kidney defects, and weakened immune responses.

Several studies suggest that exposure to 2,3,7,8-TCDD increases the risk of several types of cancer in people. Animal studies have also shown an increased risk of cancer from exposure to 2,3,7,8-TCDD. The World Health Organization (WHO) has determined that 2,3,7,8-TCDD is a human carcinogen. The Department of Health and Human Services (DHHS) has determined that 2,3,7,8-TCDD may reasonably be anticipated to cause cancer.

The EPA has set a limit of 0.00003 micrograms of 2,3,7,8-TCDD per liter of drinking water (0.00003 µg/L).

5.1.3 Chemical Description of Chlorinated Dibenzofurans

There are 135 different types of CDFs with varying harmful health and environmental effects. The compounds that contain chlorine atoms at the 2,3,7,8-positions of the dibenzofuran molecule are known to be especially harmful. Not all of the different types have been found in large enough quantities to study the physical properties. However, of those that have been studied, they do not dissolve in water easily and appear to be in the form of colorless solids.

There is no known use for these chemicals. Other than for research purposes, they are not deliberately produced by industry. Most CDFs are produced in small amounts as undesirable by-products of certain processes, such as manufacturing other chemicals or bleaching at waste and water treatment plants. CDFs can also be released from incinerators.

Exposure to CDFs may occur through:

ED_005263_00001892-00046

- Breathing air or drinking water that is contaminated, or coming in contact with contaminated soil.
- Using products such as milk cartons, coffee filters, and tampons could result in very low exposures.
- Breathing contaminated workplace air

CDFs caused skin and eye irritations, including severe acne, darkened skin color, and swollen eyelids with discharge from the eyes. CDF poisoning also caused vomiting and diarrhea, anemia, more frequent lung infections, numbness, effects on the nervous system, and mild changes in the liver. Children born to exposed mothers had skin irritation and more difficulty learning.

Many of the same effects that occurred in people also occurred in laboratory animals that ate CDFs. Animals also had severe weight loss, and their stomachs, livers, kidneys, and immune systems were seriously injured. Some animals had birth defects and testicular damage, and in severe cases, some animals died. These effects in animals were seen when they were fed large amounts of CDFs over a short time, or small amounts over several weeks or months.

The Department of Health and Human Services, the International Agency for Research on Cancer, and the Environmental Protection Agency (EPA) have not classified CDFs for carcinogenicity.

There are no federal guidelines or recommendations for protecting human health or the environment from exposure to CDFs.

5.2 Physical Hazards

The potential physical hazards at the Site during the planned activities stem from heavy machinery use and the hazardous nature of excavation work. The potential for heat stress caused by the use of personal protective equipment (PPE) and high mid-day temperatures, has been minimized by specifying the use of lighter PPE in this SSHP. The anticipated physical hazards at the Site are listed under Section 5.0. Work procedures to protect workers from chemical and physical hazards are discussed in Section 6.0.

ED_005263_00001892-00047

6.0 WORK REQUIREMENTS

6.1 Respiratory Protection

Field operations will be initiated in Level D. The primary route of potential exposure for chemicals is inhalation of fugitive dust. Dust will be kept to a minimum by continually watering the work area and haul roads. Dust filter masks, will be worn until on-site work zone air monitoring shows levels are below human health concern.

Inhalation hazards due to volatilization will be monitored visually. If onsite dust levels impair visibility during field activities, work shall be temporarily stopped to wet the area responsible for generating dust. If dust problems continue, a temporary stop work order will be observed and the WMI Health and Safety Officer shall be notified.

6.2 Dermal Protection

Unless adequate precautions are taken, chemicals may contact the skin or clothing. Potential physical contact with chemicals of concern are possible under the following circumstances:

- soil excavation and disposal

Due to the potential for adverse effects due to dermal contact with CDD-contaminated soil, long-sleeved shirts and gloves will be worn as part of Level D safety equipment until on-site work zone air monitoring shows levels are below human health concern.

6.2.1 Personal Protective Equipment

WMI and contractor/subcontractor personnel will wear the following protective clothing onsite:

- hard hats
- steel-toed/steel-shank boots
- inner and outer disposable PVC gloves for soil handling (to be changed immediately after handling is completed)
- safety glasses
- uncoated Tyvek coveralls (if the potential for splashing exists)

6.3 Action Levels

6.3.1 Action Levels for a Temporary Stop Work

ED_005263_00001892-00048

The SSO shall impose a temporary stop work and contact the WMI Health and Safety Director immediately if the following conditions are observed, or if there is a question about site conditions:

- uncontrolled dust generation
- indications of heat stress
- changes in the general health profile of onsite personnel, including headaches, dizziness, breathing difficulties, irritation to the eyes, nose, throat, and hands

6.4 Protection Against Physical Hazards

6.4.1 Excavation Instability

The limits of excavation and method(s) of shoring side walls proposed by the contractor shall be approved by the engineer before the excavation begins. Workers will not enter excavations deeper than 4 feet. All requirements pursuant to 29 CFR 1926.651 and 652, Excavations, Trenching and Shoring, shall be observed.

6.4.2 Noise

Noise results primarily from excavation equipment, drilling equipment and other machinery. Workers will wear ear plugs when operating heavy machinery to avoid noise that may exceed the 85 decibel Threshold Limit Value (TLV) established by the American Conference of Governmental Industrial Hygienists. However, based on previous field experience, expected noise level should not exceed 85 decibels.

6.4.3 Electric Shock

All electrical equipment to be used during field activities will be suitably grounded and insulated.

6.4.4 Heavy Equipment

Hazards related to excavation and compaction equipment will necessitate securing the work area. All relevant requirements pursuant to 29 CFR 1926.602 and Subpart W, Rollover Protective Structures; Overhead Protection, shall be observed during the course of excavation activities.

All field personnel not directly involved in the excavation work will be kept at safe distances from areas where heavy equipment are in use. Unauthorized visitors will not be permitted near

ED_005263_00001892-00049

areas where heavy equipment are in use regardless of whether the area has been designated as an exclusion zone.

6.4.5 General Safety

All WMI and contractor/subcontractor personnel will wear approved head protection while working around heavy equipment in the Site area. Fire hydrants, electrical and underground lines and pipes will be identified before excavation operations begin. Two 10-pound fire extinguishers will be kept on site near the exclusion zone.

6.5 Entry Procedures

At a minimum, all visitors entering the exclusion zone must wear the protective clothing and equipment worn by WMI and contractor/subcontractor personnel. Permission to enter the work area must be obtained from at least one of the personnel named in Section 4.0. Each visitor's name and purpose of visit will be recorded in the field notes.

7.0 WORK ZONE AND DECONTAMINATION PROCEDURES

A site must be controlled to reduce the possibility of exposure to any contaminants present and to limit their transport from the site by personnel or equipment.

7.1 Control

A control system is required to ensure that personnel and equipment working on hazardous waste sites are subjected to appropriate health and safety surveillance and site access control.

The possibility of exposure or translocation of contaminants can be reduced or eliminated in a number of ways, including:

- setting security or physical barriers at control points to regulate access to and/or exclude unnecessary personnel from the general area
- minimizing the number of personnel and equipment on site consistent with effective operations
- establishing work zones within the site
- conducting operations in a manner which will reduce the exposure of personnel and equipment

ED_005263_00001892-00050

- minimizing the airborne dispersion of contaminants (utilizing dust control procedures)
- implementing appropriate decontamination procedures for both equipment and personnel.

7.2 Field Operations Work Areas

Work areas (zones) will be established based on anticipated contamination. Within these zones, prescribed operations will occur utilizing appropriate PPE. Movement between areas will be controlled at checkpoints. The planned zones are:

- Exclusion (contaminated)
- Contamination Reduction
- Support (noncontaminated).

7.2.1 Exclusion Zone

The Exclusion Zone is the innermost area of the three concentric rings and is considered contaminated, dirty, or "hot." Within this area, the prescribed protection must be worn by any personnel upon entering. An entry checkpoint will be established at the periphery of the exclusion zone to control the flow of personnel and equipment between contiguous zones, and to guarantee that the procedures established to enter and exit the zones are followed.

The Exclusion Zone boundary will be established initially on the presence of the contaminant(s) within the area. Subsequent to initial operations, the boundary may be readjusted based on observations and/or measurement. The boundary will be physically secured and posted.

7.2.2 Contamination Reduction Zone

Between the Exclusion and the Support Zone is the Contamination Reduction Zone. The purpose of this zone is to provide an area to prevent or reduce the transfer of contaminants which may have been picked up by personnel or equipment returning from the Exclusion Zone. All decontamination activities occur in this area. The boundary between the Support Zone and the Contamination Reduction Zone is the contamination control line. This boundary separates the potentially contaminated area from the clean area. Entry into the Contamination Reduction Zone from the clean area will be through an access control point. Personnel entering at this station will be wearing the prescribed PPE for working in the Contamination Reduction Zone. Exiting the Contamination Reduction Zone to the Clean Area requires the removal of any suspected or known contaminated PPE, and compliance with the established decontamination procedures.

ED_005263_00001892-00051

7.2.3 Support Zone

The Support Zone is the outermost of the three rings and is considered decontaminated, or Clean Area. It contains the Command Post (CP) for field operations and other elements necessary to support site activities. Normal street or Level D work clothes are the appropriate apparel to be worn in this area.

7.3 Zone Dimensions

Considerable judgement is needed to ensure safe working distances for each zone, balanced against practical work considerations. Physical and topographical barriers may constrain ideal locations. Field/laboratory measurements combined with meteorological conditions and air dispersion calculations will assist in establishing the control zone distances. When not working in areas that require the use of chemical-resistant clothing, work zone procedures may still need to limit the movement of personnel and retain adequate site control.

7.4 Decontamination Procedures

As part of the system to prevent or reduce the physical transfer of contaminants by people and/or equipment from the site, procedures will be instituted for decontaminating anything leaving the Exclusion Zone and Contamination Reduction Zone. These procedures include the decontamination of personnel, protective equipment, monitoring equipment, clean-up equipment, etc. Unless otherwise demonstrated, everything leaving the Exclusion Zone should be considered contaminated. In general, decontamination at the site consists of dry brushing equipment with a stiff bristle brush. Reusable decontaminated PPE will be stored for air drying.

Decontamination is addressed in two ways: the physical arrangement and control of contamination zones, and the effective use of decontamination procedures.

If necessary, the decontamination process may use cleaning solutions, followed by rinse solutions. Used solution, brushes, sponges, and containers must be properly disposed of.

Decontamination Solution

Description	Usage	
3 cups Alconox 1 cup sodium carbonate	Light contamination	5-8 gallons water
Commercial Detergent -	Organic contaminants	Full strength or diluted

ED_005263_00001892-00052

As with all alkaline cleaners, continuous or repeated contact with the skin should be avoided. If an employee's skin becomes contaminated, he/she will move to the decontamination area and remove contaminated clothing, and wash with a mild soap/detergent and water to remove any contaminant from the skin. He/she will then see a physician for possible medical treatment.

A rinse solution will be used to remove the contamination solution and neutralize any excess decontamination solution.

All personnel will follow these decontamination procedures:

1. When returning from the Exclusion Zone, remove heavy soil, as necessary, from boots, gloves, and clothing by using a stiff bristle brush before entering the Contamination Reduction Zone.

2. Remove disposable suit and discard in proper container.

3. Remove outer gloves and dispose of properly.

4. Remove inner gloves and dispose of properly.

Decontamination procedures may be modified, if necessary, with the approval of the SSO.

7.4.1 Personal Decontamination During Medical Emergencies

In the event of personal injury, first-aid personnel must decide if the victim's injuries are potentially the type that would be aggravated by movement. If there is any doubt, or if the victim is unconscious and cannot respond, no attempt should be made to move the victim to the decontamination area. Only off-site paramedics may move such victims. If the paramedics approve, the victim's PPE will be cut off in the Decontamination Reduction Zone. If the decision is made not to remove the victim's protective clothing, he/she will be wrapped in a tarp or similar object to protect the ambulance and crew during transportation. If the victim is contaminated with materials that threaten to cause additional injury or immediate health hazards, the PPE will be carefully removed and the victim washed appropriately.

ED_005263_00001892-00053

8.0 EMERGENCY PROCEDURES

8.1 General Injury

- Step 1: Use first-aid kit on site, if appropriate.
- Step 2: Use off-site help and/or assistance if appropriate.
- Step 3: Notify SSO, Project Manager and Health and Safety Director.

8.2 Specific Treatments

- Eye Exposure: flush eye with eye wash, call ambulance.
- Skin Exposure: wash immediately with soap and water; call ambulance, if necessary.
- Fire (localized): use fire extinguisher and activate alarm system, if necessary.
- Fire (uncontrolled): call Fire Department.
- Chemical Spill: call Fire Department and National Response Center for Toxic Chemical and Oil Spills.
- Explosion: call Fire Department if potential for additional explosions or fire danger exists.
- Inhalation: move affected person(s) to fresh air and cover source of vapors, if appropriate.
- Swallowing: call ambulance.

ED_005263_00001892-00054

8.3 Emergency Phone Numbers

Medical/General Service Numbers

Police Department	911
Fire Department	911
Ambulance	911

Hospital

Parkview Community Hospital (951) 688-2211
3865 Jackson Street
Riverside, California

From the Site, proceed to Van Buren Boulevard. Turn right on Van Buren Boulevard and proceed south. Continue south on Van Buren Boulevard and turn left on Jackson Street. Proceed southeaste on Jackson Street to Parkview Community Hospital. Turn left into Medical Center. Parkview Community Hospital is located at 3865 Jackson Street (Figure 1).

Hazardous Materials Response/Reporting

National Emergency Response Center (800) 424-8802
California State Office of Emergency Services (800) 852-7550
Regional Water Quality Control Board (858) 467-2952

8.4 Accident Reporting Procedures

In the event of an emergency, contact the following:

George Vernaci (Health and Safety Director) (909) 949-0360
Robert Heller (Project Manager) (714) 771-5554
George Vernaci (Site Safety Officer) (909) 949-0360
If an exposure or injury occurs, work shall be temporarily halted until the SSO, in consultation with the Health and Safety Director, decides it is safe to continue work.

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9.0 DOCUMENTATION

The SSO will record field observations of health and safety procedures by workers conducting the planned activities outlined in Section 3.0, including deviations from the recommended health and safety procedures.

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10.0 MEDICAL MONITORING

Appropriate medical monitoring will be required of personnel to:

- Meet requirements of 29 CFR 1910.120 (f).
- Meet requirements for respirator use.
- Meet other legal requirements.

A signed physician's statement qualifying the individual for the work to be performed will be required as part of the medical monitoring program.

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11.0 TRAINING PROGRAM

1. The SSO shall have fulfilled all appropriate training requirements indicated by 29 CFR 1910.120 (e), including the 40-hour training requirement and required refresher courses.

2. A tailgate session to discuss this SSHP will be held before field activities begin. All personnel and contractor/subcontractor employees shall receive, at a minimum, the following information:

   - the names of personnel and alternates responsible for site safety and health
   - safety, health, and other hazards at the Site
   - instruction in the use of personal protective equipment
   - action levels
   - employee work practices to minimize risks from onsite hazards
   - instruction in the safe use of engineering controls and equipment on site
   - site control measures
   - emergency plans
   - Proposition 65 warnings.

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12.0 PROPOSITION 65

Under California's Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65), individuals who may be exposed in the work place to chemicals that may cause cancer or birth defects must be warned of such hazards pursuant to California Health and Safety Code (HSC) Section 25249.6. At this Site, the chemicals that may cause cancer or reproductive abnormalities, and their respective warnings, are listed below.

12.1 Carcinogens and Reproductive Toxicants

Chemicals known to the State of California to cause cancer, as listed in Title 22, California Code of Regulations (CCR) Section 12000(b), which may be present at the Site include benzene. Chemicals known to the State of California as reproductive toxicants, as listed in Title 22, CCR Section 12000(b), which may be present at the Site include lead.

12.2 Warnings

Pursuant to HSC Section 25249.6 and CCR Sections 12601(c)(3)(A) and 12601(c)(3)(B), the following warnings must be made:

"This area contains chemicals known to the State of California to cause cancer."

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13.0 SIGNATURES

13.1 Waste Management Personnel

This SSHP for the proposed site operations at the Ag Park Project in Riverside, California, is approved by the following Waste Management personnel and Waste Management Representatives:

George Vernaci Health and Safety Director	Date
Rob Heller Project Manager	Date
George Vernaci Site Safety Officer	Date

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13.2 Contractor and Subcontractor Personnel

Contractor and Subcontractor Agreement:

1. Contractor certifies that the following personnel noted below to be employed in the soil remedial activities at the Support Sector/Air Operations facility in San Diego, California, have met the requirements of the OSHA Hazardous Waste Operations and Emergency Response Standard 29 CFR 1910.120 and other applicable OSHA Standards.

2. Contractor certifies that in addition to meeting the OSHA requirements, it has received a copy of this SSHP, and will ensure that its employees are informed and will comply with both OSHA requirements and the guidelines in this SSHP.

3. Contractor further certifies that it has read, understands and will comply with all provisions of this SSHP, and it will take full responsibility for the health and safety of its employees.

Subcontractor	Signature	Date

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APPENDIX E

WORKPLAN FOR AIR MONITORING

ED_005263_00001892-00062

06 October 2005
revised 14 December 2005
AGE Project No.: RC684E7.1443

Mr. Robert Heller
Project Manager
Waste Management, Inc.
3738 East Rolling Green Lane
Orange, California 92867

Subject: **Work Plan for Air Monitoring As Required To Comply with the Response Plan and South Coast Air Quality Management District Rule 403- Fugitive Dust at Agricultural Park**
7020 Crest Avenue, Riverside, California

Dear Mr. Heller:

A work plan to ensure the quality and accuracy of air monitoring conducted at the subject site is enclosed. A copy of this work plan will be maintained on-site for reference and guidance. If you have any questions, please contact me at (714) 529-0200.

Sincerely,

Advanced GeoEnvironmental, Inc.

Dennis Michael Delaney
Director, Air Quality Division

Work Plan

WORK PLAN FOR AIR MONITORING AS REQUIRED TO COMPLY WITH THE RESPONSE PLAN AND SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 403- FUGITIVE DUST

Agricultural Park
7020 Crest Avenue, Riverside, California

1.0 INTRODUCTION

Waste Management, Inc. has been contracted by the Friends of the Riverside Airport (FRA) to provide removal of hydrocarbon-impacted soil at the agricultural park located in the vicinity of the Santa Ana Riverbed and Crest Avenue in the City of Riverside, California. An Assessment and survey of this property has shown the soil to be impacted with polychlorobiphenyls (PCBs). Dioxins and furans, byproducts of PCB degradation, are also considered chemicals of potential concern (COPCs). Therefore, under the oversight of the Department of Toxic Substance Control (DTSC) and the South Coast Air Quality Management District (SCAQMD), environmental monitoring during excavation is required. Monitoring will be conducted in accordance with procedures outlined in SCAQMD Rule 403 – Fugitive Dust. This monitoring includes, but may not be limited to: meteorological monitoring of wind conditions and relative humidity; real time particulate monitoring both upwind and downwind of the workface during excavation and grading; and monitoring for airborne concentrations of PCBs.

In response to the requirements of this contract, *Advanced* GeoEnvironmental, Inc. (AGE) has developed an Air Quality Management Program for Waste Management, Inc., designed to ensure compliance with the approved Response Plan (RP) as well as South Coast Air Quality Management District (SCAQMD) Rule 403 – Fugitive Dust. For the purposes of this document, Fugitive Dust is identified as airborne particulate matter, with an aggregate particle diameter of 10 microns or less (PM_{10}), which has been entrained into the air through anthropogenic (man-made) pathways.

Under the provision of South Coast Air Quality Management District SCAQMD Rule 403 – Fugitive Dust, owners/operators of facilities (or projects) are required to limit emissions of fugitive dust generated by their activities. Preparation and submission of a Fugitive Dust Plan and ambient air monitoring are required for projects that cover an aggregate area exceeding 50 acres. Since this area is far less than 50 acres, notification of the SCAQMD and submission of a monitoring plan for approval are not required. However, all contractors operating within the jurisdiction of the SCAQMD are required to comply with the emission controls and limitations specified in the Rule.

The purpose of this Work Plan is to outline the procedures to be followed in order to comply with the monitoring protocol presented in the SCAQMD Rule 403 Implementation Plan, as well as the action levels for worker and public safety stipulated

in the RP. Monitoring will complement the voluntary Fugitive Dust Plan (separate cover) prepared for this project, to demonstrate compliance with the Rule.

2.0 BACKGROUND

2.1 SITE SETTING

The site consists of approximately 62 acres of undeveloped land, with a simple roofed structure positioned near its center. The site is relatively flat, with a mean elevation of approximately 740 feet above mean sea level (msl). It is surrounded by the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east, and the Chino Hills and Santa Ana Mountains to the west and south. Crest Avenue borders the property to the west, with residential developments to the west of the road. The area to the south and east is developed with residential homes. The Santa Ana River Wash bounds the site to the north.

The site was used as a sewage treatment plant in the early 1940's by the United States Army. The Arlington Utility Company retained management of the plant from the mid-1940's through 1961, at which time the City of Riverside took control of the property and operated the plant until it was decommissioned in 1965. The City retained ownership of the property, and used the two oval-shaped basins as brine ponds through the early 1970's.

In 2003, the City entered into a contract for redevelopment with the FRA. During demolition of existing structures, fluids were discovered in abandoned tanks that were found to contain PCB's. Environmental investigation has determined that PCB-contaminated soil exists over approximately 45 acres of the site, with soil concentrations ranging from 0.009 milligrams per kilogram (mg/kg) to 9,560 mg/kg. Demolition and redevelopment were discontinued until the contamination could be remediated.

2.2 FUGITIVE DUST CONTROL REQUIREMENTS

The SCAQMD adopted Rule 403 – Fugitive Dust in 1976. Amended in 1997, the Rule regulates anthropogenic fugitive dust sources within the jurisdiction of the SCAQMD, requiring facilities with the potential to emit or generate fugitive dust to take appropriate action to prevent, reduce, or mitigate those emissions. Portions of the South Coast Air Basin are designated non-attainment for PM_{10} (particulate matter with an aerodynamic diameter of 10 microns or less), which makes control of localized emissions critical. Rule 403(d)(4) states: "A person shall not cause or allow PM_{10} levels to exceed 50 micrograms per cubic meter when determined, by simultaneous sampling, as the difference between upwind and downwind samples collected on high volume particulate matter samplers or other EPA-approved equivalent method for PM_{10} monitoring. When sampling is conducted, samplers shall be:

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(A) Operated, maintained, and calibrated in accordance with 40 Code of Federal Regulations (CFR), part 50, Appendix J, or appropriate EPA-published documents for EPA-approved equivalent methods for PM_{10}.

(B) Reasonably placed upwind and downwind of key activity areas and close to the property line as feasible, such that other sources of fugitive dust between the sampler and the property line are minimized."

Protocol established for Rule 403 compliance testing require simultaneous sampling upwind and downwind of a suspected source for a period of five hours. These requirements are intended to provide a means to isolate the potential emissions from the monitored source, and identify the level of concentration of those emissions. "Upwind" and "downwind" are meteorologically-derived terms: upwind identifies a position relative to the potential source of emissions TOWARDS THE DIRECTION FROM WHICH THE WIND IS BLOWING (if the wind is generated northwest of the monitored site, then upwind would be northwest of the site); downwind similarly identifies a position relative to the source of emissions TOWARDS THE DIRECTION TO WHICH THE WIND IS BLOWING (the wind will travel from the site to the downwind location).

The five-hour requirement was chosen by scientific investigation. It represents a period of steady wind direction that may be expected during any season of the year. Wind is driven by variations in surface temperature and pressure. These can be affected by variations in season as well as by the passage of synoptic-scale storms. Surface heating is less during winter, providing a shorter period during which stable winds might be observed. Surface heating fluctuates daily as well as seasonally, providing regular changes to the local wind field. In general, winds at night are light and variable, when surface heating is minimal. Daytime winds are stronger, and more stable in direction. Therefore, the most stable winds are produced in the period covering late morning to early evening at any time of year. Five hours reflects the mean period, irrespective of season, over which directionally stable winds occur. This period also corresponds to the normal period of operations at commercial/industrial facilities and will therefore both maximize the potential for emissions and define the emission potential of the suspected source.

2.3 PUBLIC HEALTH AND SAFETY REQUIREMENTS

Polychlorinated biphenyls (PCBs) (C.A.S. 1336-36-3) are a family of man-made chemicals that contain 209 individual compounds with varying levels of toxicity. The seven classes of PCBs described here include 35 percent of all PCBs and 98 percent of PCBs sold in the U.S. since 1970, most of which are known in the U.S. by their industrial trade name, Aroclor.

Because of their insulating and nonflammable properties, PCBs have been widely used as coolants and lubricants in transformers, capacitors, and other electrical equipment.

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The manufacture and use of PCBs in new products stopped in the U.S. in October 1977, because of evidence that PCBs accumulated in the environment and could cause human health hazards. Although PCBs are no longer manufactured, exposure still occurs. Many older transformers and capacitors, which have lifetimes of 30 years or more, still contain fluids made with PCBs. Old fluorescent lighting fixtures may contain PCBs as well.

Another major source of PCB exposure is from contaminated indoor air in buildings that contain devices made with PCBs.

2.3.1 Health Effects

PCBs are classified by EPA as carcinogens, particularly with regard to the liver. Reproductive and developmental effects may also be related to occupational exposure to PCBs and eating contaminated fish. Studies indicate that PCBs concentrate in human breast milk. PCBs can be passed easily into the bloodstream from a pregnant woman to a fetus, and from a breastfeeding mother to a nursing infant. Slight effects on birth weight, head circumference, gestational age and/or neonatal behavior have been reported in infants of mothers who were consumers of PCB-contaminated fish.

Exposure to PCBs can also be by inhalation or skin contact. Studies show that irritations such as lesions, rashes, and burning eyes and skin can occur in PCB-exposed workers.

Populations at high risk of exposure to PCBs include nursing infants whose mothers consume large amounts of contaminated fish; embryos, fetuses, and neonates; and people who work or live in buildings that have high concentrations of PCBs in the indoor air supply.

2.3.2 Exposure Values

IDLH: 5 mg/m^3 Not applicable for Cholrodipheyl (54% chlorine), a potential human carcinogen. (NIOSH, 1997)

TLV TWA: 0.5 mg/m^3 For chlorodiphenyl (54% Chlorine). Skin. (ACGIH, 1999)

TLV STEL: 1 mg/m^3 For Chlorodiphenyl (54% Chlorine). Skin (ACGIH, 1999)

NIOSH REL: **Ca** TWA 0.001 mg/m^3

OSHA PEL: TWA 1 mg/m^3.

2.3.3 Economics

PCBs are no longer produced or used in the production of new products in the United States. Disposal of PCB materials that are still in service is controlled by federal regulations.

Annual U.S. production of PCBs peaked in 1970 when 85 million pounds were produced. Monsanto, the sole U.S. manufacturer at the time production was banned, had been producing Aroclors 1016, 1221, 1242, and 1254 at a facility in Sauget, Illinois.

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2.3.4 Regulation

The Food and Drug Administration (FDA) has issued permissible levels of PCBs in food and packaging. PCBs are regulated by the U.S. Environmental Protection Agency under the Clean Water Act Effluent Guidelines.

Under Section 313 of the Emergency Planning and Community Right to Know Act of 1986, releases of more than one pound of polychlorinated biphenyls into the air, water, and land must be reported annually and entered into the Toxic Release Inventory (TRI).

3.0 PROCEDURES

3.1 SITE EXCAVATION

As stated by the contractor, approximately 90 - 120 working days (3 to 4 months) will be required to complete the project. Monitoring will be conducted during the operation, to be implemented in accordance with the following Rule conditions:

- Preparation and implementation of a Fugitive Dust Plan.
- Monitoring of wind speed and direction and particulate matter (PM_{10}).
- Monitoring of PCB levels.

Mobilization for the excavation has been scheduled to commence on 5 July 2006 . It is assumed that the planned work day is scheduled from 07:00 AM through 05:00 PM, with one hour for lunch each day. Monitoring will be conducted during working hours.

3.2 WIND MONITORING

A MetOne Instruments, Inc. wind sensor, Model # G034A, will be installed in the vicinity of the property. The sensor will be battery-operated, with a solar panel for sustainability, and will continuously record wind speed and direction during the excavation. The monitor will be installed in accordance with the siting criteria outlined in 40 CFR Part 50, and will be aligned to true north. Analog data will be transmitted from the wind speed and direction sensors to a data logger. Data will be downloaded for analysis at the end of each week, as well as at the conclusion of each particulate monitoring episode.

3.3 PARTICULATE MONITORING

Monitoring for concentrations of PM_{10} upwind and downwind of the work site will be conducted continuously, to record compliance with the emission limits imposed by the RAW and by SCAQMD Rule 403. Monitoring for particulates will be conducted in accordance with the protocol established under SCAQMD Rule 403 – Fugitive Dust, modified to include real-time particulate monitors. Namely:

> A person shall not cause or allow PM_{10} levels to exceed 50 micrograms per cubic meter when determined, by simultaneous sampling, as the difference between

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upwind and downwind samples collected on high-volume particulate matter samplers or other U.S. EPA-approved equivalent method for PM_{10} monitoring. If sampling is conducted, samplers shall be:

(A) Operated, maintained, and calibrated in accordance with 40 Code of Federal Regulations (CFR), Part 50, Appendix J, or appropriate U.S. EPA-published documents for U.S. EPA-approved equivalent method(s) for PM_{10}.

(B) Reasonably placed upwind and downwind of key activity areas and as close to the property line as feasible, such that other sources of fugitive dust between the sampler and the property line are minimized.

Fugitive dust testing will be conducted employing upwind and downwind Thermo Andersen DataRam Aerosol Monitors, Model 4000. Sampling at each location will be conducted simultaneously over at least a five-hour monitoring period. The monitoring period will be chosen such that the wind speed is measurable and the wind direction is steady. The monitors shall be placed such that the vector from the upwind to the downwind location corresponds with the prevailing wind direction ($\pm 15^{o}$). A monitoring event will be considered valid if the following conditions are met:

- Each monitor is operated for five hours (300 minutes).
- The starting and stopping times of the upwind and downwind samplers shall be the same, ± 10 minutes.
- Each monitor will operate at its calibrated rate of between 1.7 and 2.3 liters per minute, ± 10%, throughout the five-hour monitoring interval.
- The direction of the wind will remain constant throughout the sampling period, ± 15%, such that the upwind/downwind relationship is maintained.

Known performance characteristics of the monitors are critical to the successful collection of valid particulate data. Monitors will be calibrated in accordance with manufacturer's specifications, adhering to the guidelines promulgated in 40 CFR, Part 50, Appendix J. A multi-point calibration will be conducted on each sampler prior to placement in the field. Single-point calibrations of each sampler will be conducted in the field prior to each monitoring event. Deviations of more than 10% from the formal calibration curve will require a full multi-point calibration prior to operation. The flow-rate recorder will be monitored during each run, and deviations of more than 10% from the calibrated flow rate will invalidate the run.

Quality Assurance will be maintained throughout the period of the contract. Sampler calibration records will be maintained, to determine the overall accuracy and efficiency of the samplers. Maintenance records will be kept on each sampler, in accordance with the guidelines set forth in Sections 2.2 and 2.10 of EPA/600/R-94/038b, *Quality Assurance Handbook for Air Pollution Measurement Systems.*

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Fugitive dust sampling will take place daily. Andersen DataRam monitors will be placed upwind and at up to three downwind locations prior to the commencement of soil removal. Data collected from these monitors will be recorded at 30-minute intervals. A simple averaging technique will provide hourly concentrations, which will be combined to provide the 5-hour concentration. An action level of 7µg dust/m^3 will be established, measured as the difference between upwind and downwind monitors over a one-hour monitoring period. This action level has been selected to incorporate the fence line action level of fugitive dust containing PCBs. If exceedances of the 7 µg dust/m^3 concentration limit are encountered indicating potentially elevated levels of PCBs, additional watering or other appropriate control measures will be implemented to reduce the level of dust generated.

Samplers will be started and stopped within ±10 minutes of each other. Samplers will be operated for a total of 5 hours in an upwind/downwind configuration. Wind Speed and Direction data will be collected for the period in which the samplers are operated, to complete the vector analysis. The following limitations apply to particulate monitoring:

- Monitoring will not be conducted on days when the sustained (15-minute average) wind speed exceeds 15 miles per hour (mph), or if gusts exceed 25 mph. Monitoring initiated before these limits are reached will be curtailed and the samples annotated as void due to excessive winds.

- Monitoring will not be conducted during periods of rain. If, once monitoring has been initiated, measurable rainfall occurs (>0.1"), the monitoring on that day will be cancelled and the samples annotated as void due to precipitation.

Monitoring will not be scheduled within 72 hours of measurable precipitation

3.4. PCB MONITORING

Section 25323 of the California Health and Safety Code requires that personal monitoring for airborne concentrations of toxic air contaminants be conducted at regular intervals during the excavation. Real-time monitors for PCBs are not available. Therefore, levels of PCBs will be monitored in accordance with procedures outlined in NIOSH Method 5503. Gilian Gilair5 samplers will be employed, fitted with sample cassettes developed with a combination of glass fiber filter and solid sorbent (XAD-2 resin and polyurethane foam). Samples will be collected downwind of the daily excavation site each day, over an 8-hour sampling interval, in order to compare action levels with established permissible exposure limits. The NIOSH threshold limit for PCBs is 0.001 milligrams per cubic meter (mg/m^3), measured over an 8-hour monitoring period. The action level established for this project is 0.00007 mg PCB/m^3. Samples will be analyzed using EPA Method 8082, modified for PCBs. Monitoring will be conducted daily during the first two weeks of the excavation. If the action level is not exceeded, PCB monitoring will be reduced to twice weekly. However, if during this period the action level is exceeded, daily monitoring will resume. The following table identifies the maximum soil

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concentrations of the COPCs found at the site, as well as their established Community Action Levels.

Chemical	Max Soil Conc. (mg/kg)	CAL/OSHA PEL (mg/m^3)	Community Action Level (mg COPC/ m^3)	Total COPCs in air (mg/m^3) based on Community Action Level of dust at 0.05, 1 and 5 mg/m^3		
Total Dust	-	10		0.05	1	5
PCB	9560		7E-05	4.78E-04	9.56E-03	0.0478
TCDD	3.85E-04		7E-09	1.925E-11	3.85E-10	1.925E-09

3.5 DIOXIN/FURAN MONITORING

Monitoring for dioxins and furans requires high-volume samplers fitted with polyurethane foam (PUF) sleeves. Samples are collected in both this media and on a quartz filter over an 8-hour sampling interval. The samples are then analyzed by EPA Method TO-9A. Monitoring for these COPCs may be required, depending upon the results of co-located soils samples, to be collected by Frey Environmental, Inc.

4.0 QUALITY ASSURANCE

To ensure that the data collected is as true and accurate as possible, and that the protocol and results of this project are traceable under standard scientific protocol, quality assurance procedures will be applied to each element of field monitoring. These procedures include:

- Complete calibration records on each sampler. Daily flow checks will be included in each equipment log, for comparison. Multi-point flow calibrations will be conducted if any daily flow check is not within ±10% of the calibrated value. If additional multi-point flow calibrations are required, records of these calibrations will be maintained in the log.

- In order to ensure that procedures are followed uniformly throughout the project, each staff member involved in this project will read this Work Plan and sign the following acknowledgement that the Plan has been read and understood.

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Work Plan for Air Monitoring As Required To Comply with the Response Plan and South Coast Air Quality Management District Rule 403- Fugitive Dust
Agricultural Park
7020 Crest Avenue, Riverside, California

Staff involved in conducting monitoring the excavation of the abandoned agricultural facility in Riverside, California have read and understand the required monitoring procedures listed in this Plan.

Date	Company	Name	Signature

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APPENDIX F

SEWER LINE EXCAVATION WORKPLAN DATED OCTOBER 25, 2005

ED_005263_00001892-00073

FREY ENVIRONMENTAL, INC.

Environmental Geologists, Engineers, Assessors

2817 A Lafayette Avenue
Newport Beach, CA 92663
(949) 723-1645
Fax (949) 723-1854
Email: freyinc@freyinc.com

October 25, 2005
485-01

Maryam Tasnif-Abbasi
State of California
Department of Toxic Substance Control
5796 Corporate Avenue
Cypress, CA 90630

Re: Assessment and Excavation
of Influent Sewer Line
Former Agriculture Park
7020 Crest Avenue
Riverside, California

Dear Ms. Tasnif-Abbasi:

This abbreviated workplan has been prepared to excavate and remove the influent sewer pipe at the Agriculture Park in Riverside, California (Site, Figure 1). The Arlanza Sewage Treatment Plant, which formerly occupied the Site, was serviced by a 27-inch diameter, vitrified clay pipe. The influent sewer pipe originated from a junction box located approximately 475 feet south of the southern property line. The influent sewer line entered the Site at a point approximately 350 feet east of the southwestern corner of the Site. The depth of the top of the sewer line at the point of entry onto the Site is estimated to be 9.7 feet below the ground surface (bgs). The sewer pipe terminates at a point between the two former southern digesters. The depth of the top of the sewer line at the termination point is estimated to be 4.5 feet bgs. The location of the influent sewer line is shown on Figure 2.

SCOPE OF WORK

Pre-Excavation Activities

A State of California licensed land surveyor will stake the projected location of the sewer line based upon the northings and eastings presented on the City of Riverside as built drawings from the Arlanza Sewer Line drawings from April 1964. Survey stakes will be placed at 100 foot intervals over the length of the sewer line to guide the excavation. Each survey stake will list the projected depth to the top of the sewer line.

Excavation of the Influent Sewer Pipe

Excavation of the sewer line will be conducted after completion of soil excavation activities in the southern portion of the Site as discussed in the Response Action Plan.

Excavation will be initiated at the northern termination point of the sewer line. The sewer line terminates in the vicinity of TP20 in an area which will be excavated to depths between 3 and 10 feet as part of the Response Action Plan.

Soil excavation will be conducted with a Caterpillar 330 excavator with a 3-foot bucket. The excavator will remove soils along the pipe run from north to south. A 20-foot wide strip of plastic will be placed on the ground on each side of the excavation. Soils excavated to the top of the pipe will be placed on the west side of the excavation. These soils will not be sampled and will be used as excavation backfill. Soils excavated from the sides of the pipe and beneath the pipe will be placed on the east side of the excavation. Soils placed on the east side of the pipe will be sampled as discussed in the section below.

The pipe will be broken as it is removed from the trench. The pipe will be separated from the excavated soil and placed in a separate pile. The broken pipe will be disposed of at Waste Management's Kettleman Hills facility.

At a point approximately 50 feet from the southern property line, the excavation will be sloped back at a 2:1 ratio to allow for safe entry into the excavation. At the southern property line, a clay pipe stopper or concrete cap will be placed on the pipe.

As excavation progresses, orange construction fence will line each side of the excavation to prevent access. Air monitoring will be conducted per the specifications set forth in the response action plan. In addition, vapor monitoring will be conducted with an organic vapor analyzer per South Coast Air Quality Management District Rule 1166.

Soil Sample Collection Procedures

Soil samples will be collected at the completion of excavation activities. Soil samples will be collected at approximate 50 foot linear intervals throughout the length of pipe excavation as shown on Figure 3. Twelve soil samples (P1 through P12) will be collected with the assistance of an excavator. The excavator will scrape the center of the surface of the excavation which remains after removal of the sewer pipe. Soil samples will be collected in laboratory supplied 4-ounce glass jars inserted directly into soils collected in the center of the bucket.

Eleven soil pile samples will be collected from the soils excavated from the sides and bottom of the pipe which will be placed on the east side of the trench. The soil pile samples will be collected at 50 foot intervals throughout the length of the soil pile. The soil pile sample locations will be staggered so that they occur at the midpoint between the soil samples collected from the trench

bottom. Soil pile samples will be collected by removing between 6 and 12-inches of soil from the top of the soil pile and then inserting a laboratory supplied 4-ounce glass jar directly into the freshly exposed soil.

The base of the excavation and the soil pile are considered as two separate sampling sub-areas. As discussed in the Neptune and Company's Sample Size Calculation memorandum dated July 5, 2005, 10 soil samples collected from each sub-area would be sufficient to evaluate the health risks associated with PCBs in soils slated for residential development.

Soil Sample Handling and Documentation

The open end of each jar will be covered with teflon tape and capped with an air tight screw lid. Each sample will be labeled with the time and date of collection, sample and job number. After labeling, each soil sample will be immediately placed in a cooler chilled with blue ice.

Soil samples will immediately be placed in a cooler chilled with blue ice. Sample containers will be placed in clear, plastic, leak resistant bags prior to placement in the cooler. All screw capped containers will be double checked for tightness. Styrofoam packing may be used as additional packaging for water sample shipment. The chain of custody form will be placed in a water-resistant plastic bag and placed inside the cooler.

A temperature blank consisting of a 40 mL glass vial of distilled water will be included in each cooler sent to the laboratory. The temperature blank will allow the laboratory to make a representative measurement of the sample temperature inside the cooler.

Samples slated for analysis at Calscience Environmental Laboratories, Inc., will be delivered to the laboratory each working day. If delivery can not be made due to later working hours, then the samples will be stored in a secured location overnight and delivered to the laboratory the next working day. Sample handling, transport, and delivery to the laboratory will be documented using Chain-of-Custody procedures and forms.

LABORATORY ANALYSES OF SOIL SAMPLES

Soil samples will be analyzed for PCBs in accordance with EPA Method No. 8082. Samples will be analyzed on a 24 hour turnaround basis by Calscience Environmental Laboratories. Calscience's quality assurance and quality control information has been previously remitted to the DTSC.

REPORTING

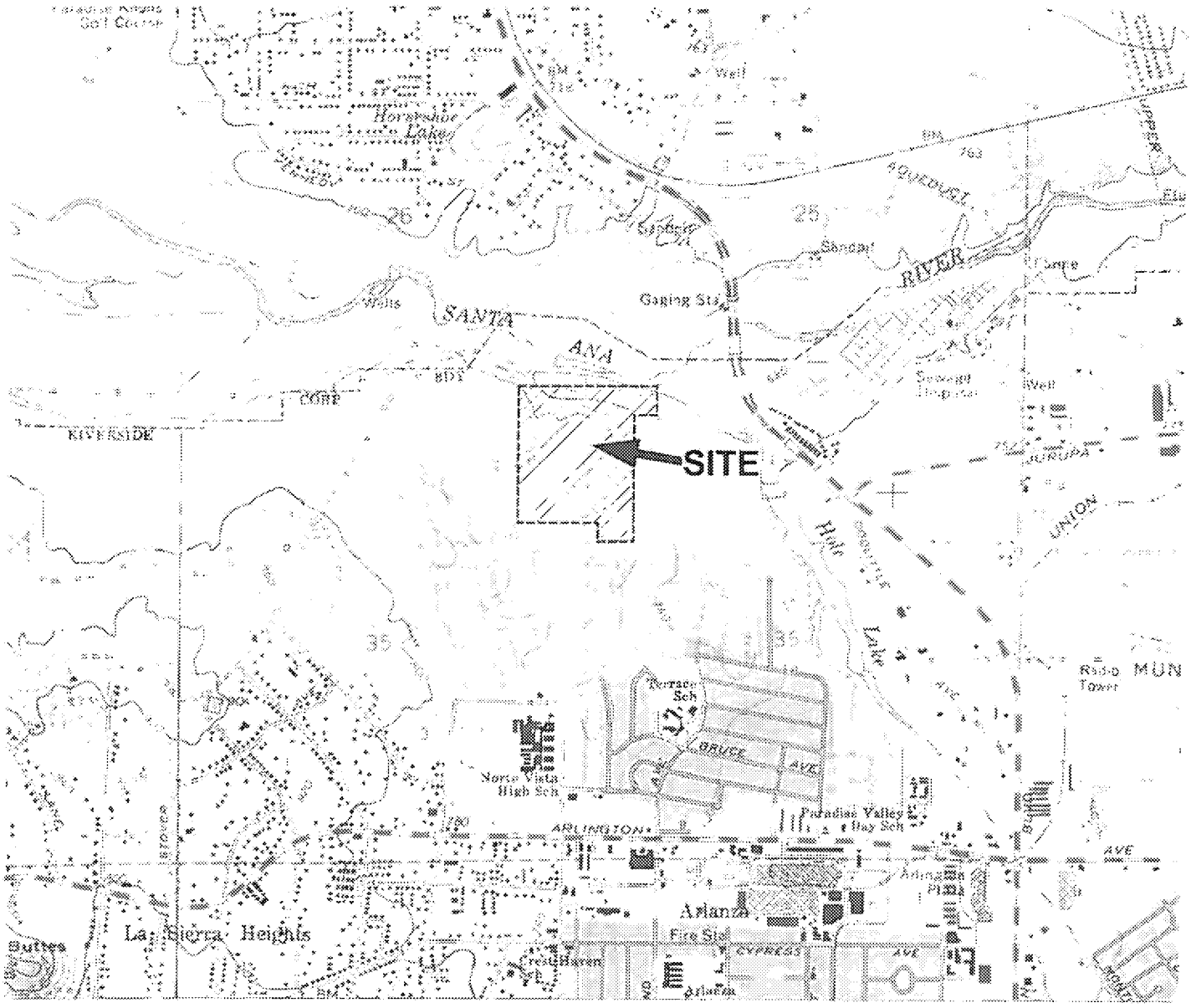
Soil sample data and excavation activities will be discussed in the final excavation report submitted as part of the Response Action Plan.

Sincerely,
FREY Environmental, Inc.

Joe Frey
Principal Geologist
CEG #1500

Evan Privett
Senior Project Geologist
PG#7880

Attachments:
Figure 1 - Site Location Map
Figure 2 - Site Sketch, April 1964
Figure 3 - Site Sketch Showing Proposed Soil Sample Locations



NORTH

0 1/2 1

SCALE IN MILES

AGRICULTURAL PARK
RIVERSIDE, CALIFORNIA

Client: FRIENDS OF THE RIVERSIDE AIRPORT LLC

Project No.: 485-01

FREY ENVIRONMENTAL, INC.

NOTE:

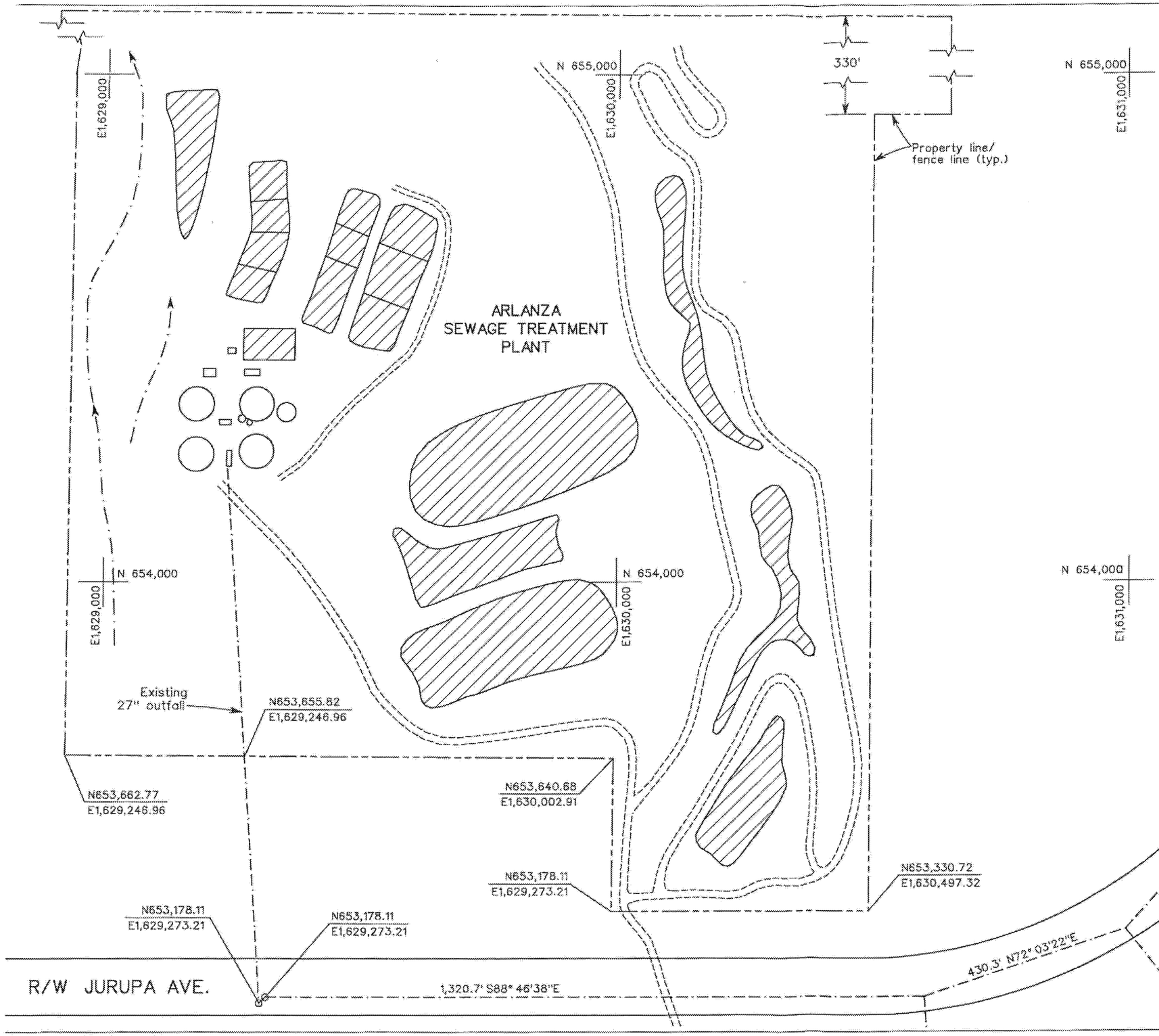
1) All locations and dimensions are approximate.
2) Base map from USGS 7.5 minute California topographic quadrangle, printed from Topo.

SITE LOCATION MAP

Date: AUGUST 2005

Figure: 1

ED_005263_00001892-00078



NOTES:

1) All locations and dimensions are approximate.
2) Site Sketch from City of Riverside Department of Public Works drawing titled "Arlanza Trunk Sewer Interceptors", proj. no. S-613, sheet 2 of 14, dated March 3, 1965.

NORTH

0 200 400

APPROXIMATE SCALE IN FEET

AGRICULTURAL PARK
RIVERSIDE, CALIFORNIA

Client: FRIENDS OF THE RIVERSIDE AIRPORT, LLC

Project No.: 485-01

FREY ENVIRONMENTAL, INC.

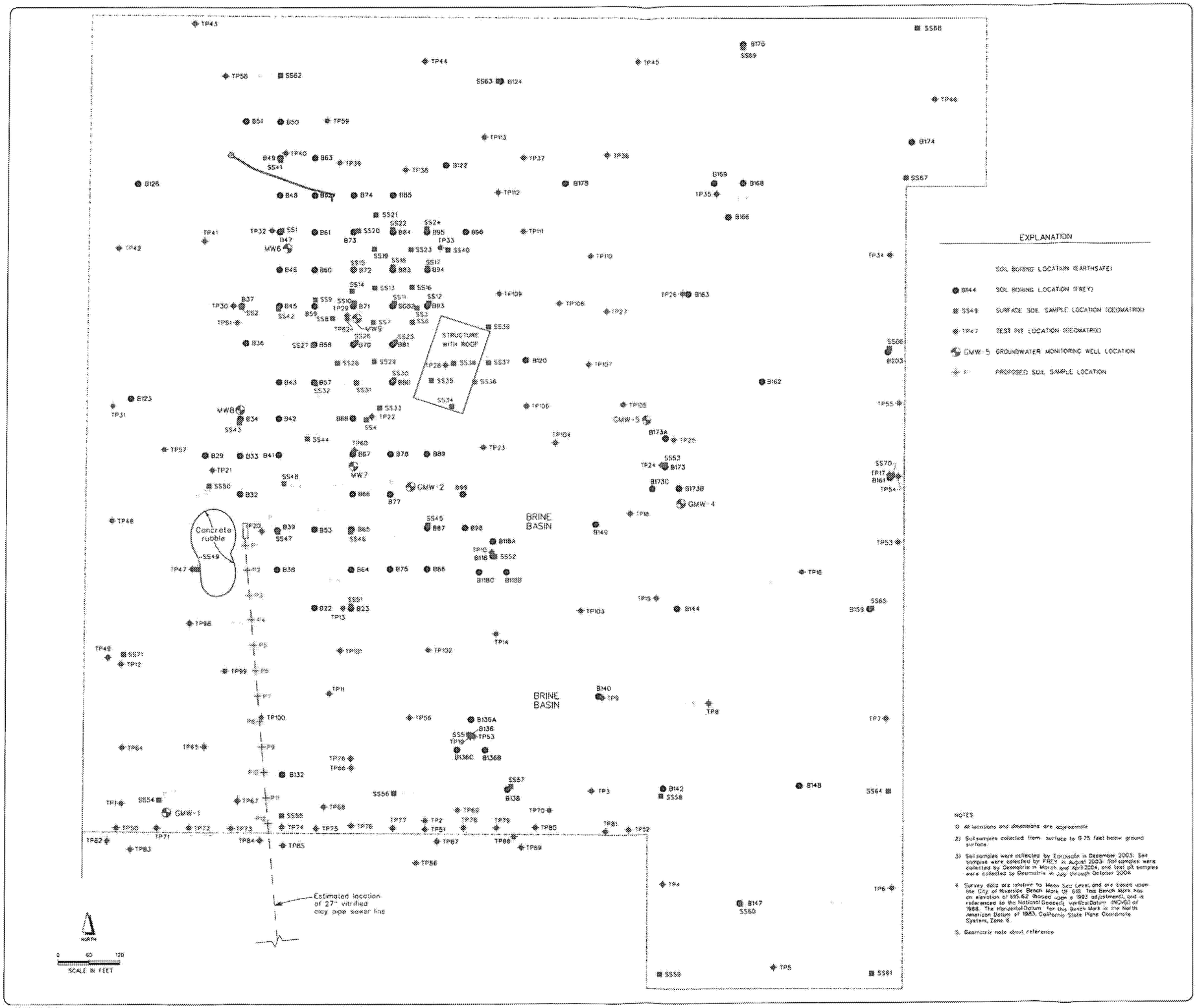
SITE SKETCH,
APRIL 1964

Date: OCTOBER 2005

Figure 2

485-01/48501-April-1964.dgn

ED_005263_00001892-00079



EXPLANATION

- SOIL BORING LOCATION (EARTHSAFE)
- B144 SOIL BORING LOCATION (FREY)
- SS49 SURFACE SOIL SAMPLE LOCATION (GEOMATRIX)
- TP47 TEST PIT LOCATION (GEOMATRIX)
- GMW-5 GROUNDWATER MONITORING WELL LOCATION
- PROPOSED SOIL SAMPLE LOCATION

NOTES:

1) All locations and dimensions are approximate.

2) Soil samples collected from surface to 0.75 feet below ground surface.

3) Soil samples were collected by Earthsafe in December 2003. Soil samples were collected by FREY in August 2003. Soil samples were collected by Geomatrix in March and April 2004, and test pit samples were collected by Geomatrix in July through October 2004.

4) Survey data are referred to Mean Sea Level and are based upon the City of Riverside Bench Mark 08 688. This Bench Mark has an elevation of 895.62 (based upon a 1993 adjustment), and is referenced to the National Geodetic Vertical Datum (NGVD) of 1988. The Horizontal Datum for this Bench Mark is the North American Datum of 1983, California State Plane Coordinate System, Zone 6.

5) Geomatrix note about reference

REVISIONS	BY

CLIENT:
FRIENDS OF THE RIVERSIDE AIRPORT, LLC

SITE SKETCH SHOWING PROPOSED SOIL SAMPLE LOCATIONS

AGRICULTURAL PARK
RIVERSIDE, CALIFORNIA

FREY ENVIRONMENTAL, INC.
2815 A LAFAYETTE AVE.
NEWPORT BEACH, CA. 92663
(949) 723-1645

DRAWN	NV
CHECKED	EP
DATE	OCTOBER, 2005
SCALE	AS SHOWN
JOB NO.	485-01

Figure 3

485-01/485001 20.dgn

APPENDIX G

NEPTUNE AND COMPANY, INC. MEMORANDUM DATED JULY 5, 2005

FREY

NEPTUNE AND COMPANY, INC.
2031 Kerr Gulch Road
Evergreen, CO 80439
Phone: (720) 746-1803
Fax: (720) 746-1605

MEMORANDUM

From: Paul Black, and Paul Duffy

To: Evan Privett, Frey Environmental

Date: 5 July 2005

Subject: Sample size calculations for the Riverside site.

This memorandum documents assumptions made in sample size calculations needed to support the Riverside site RAP (Remedial Action Plan). The calculations are based on information obtained from Evan Privett of Frey Environmental, including the draft RAP dated 19 May 2005 and prepared by Frey Environmental, figures related to the site that were prepared by Frey Environmental, and a partial data set of PCB concentrations from samples collected from the Riverside site that was provided by Evan Privett of Frey Environmental. The data set used to support the sample size calculations is presented in Appendix A.

The calculations in this document address sample size calculations for post-remediation confirmation that risk based threshold have been addressed for the site. This is a calculation of the sample size required to determine if the mean total PCBs concentration at the Riverside site is less than the threshold concentration of 0.22 ppm. This calculation is made assuming that all areas with concentrations exceeding the 0.22 ppm threshold have been excavated and disposed off-site.

The basis for all the sample size calculations presented in this document is a non-parametric classical statistical hypothesis test. This test is based on comparing an average concentration to a PCB threshold concentration (e.g. 0.22 ppm). Inputs for the calculations include an estimate of the variance (from the site concentrations of total PCBs), a desired significance level, and desired power of the test that must be specified at a concentration of interest (which determines the tolerable difference from the threshold value). The stakeholders should provide the inputs that deal with the specification of tolerable decision errors (significance level and power). The variance inputs have been estimated based on the data provided. In this document, because tolerable decision errors have not been provided, sample size estimates are provided for various combinations of the required inputs.

To clarify, the significance level of the test is interpreted as the tolerance for making a specific decision error – in this case declaring the average site concentration as less than the threshold

when it is in fact greater. This is often termed the Type I error. The power of the test is the (additive) complement of the other type of decision error, termed the Type II error (power = 1 – Type II error). Type II error must be specified at a concentration that is an acceptable distance from the threshold stated in the hypothesis test. An acceptable magnitude of difference from the mean is a quantity that should be agreed upon by all involved stakeholders. A Type II error occurs if the average site total PCBs concentration is declared greater than the threshold when it is in fact less than the threshold. As one specifies power further away from the threshold stated in the hypothesis, fewer samples are needed to meet the specified tolerances for decision error.

Decision errors occur because the site is sampled rather than taking a census. Sampling does not always provide the correct answer, but the more samples that are taken the more likely the correct decision will be made. The sample size calculation deals with trade offs between tolerance for decision errors and costs of taking samples. For example, as the tolerance for making a decision error decreases, the sample size should increase because there is less willingness to be wrong. In general, as the acceptable probability of decision error (both Type I and Type II) decreases, the number of samples needed increases. Additionally, as the point at which the Type II error is specified moves closer to the threshold stated in the hypothesis, the more samples are needed.

The calculations below cover a range of possible assumptions regarding Type I and Type II error tolerances, and the point at which the Type II error is specified. This provides a general idea of the consequences (changes in the number of samples) of relaxing error tolerances. Decision error tolerances should, however, be specified according to the importance of the decisions that are being made. The proposed future residential land use provides strong motivation to ensure that the site is not declared "clean" when in fact it is not. Hence the Type I error or significance level should be fairly small. At the same time, the responsible parties (e.g. developers) want to make sure that remediation is not performed unnecessarily, hence Type II error tolerance should not be too large (depending on the average concentration at which it is specified). Specification of these error terms should be performed by the stakeholders or by the project team.

The basic formula used for calculation of sample size is often used or cited by EPA. It is based on a non-parametric test (the Wilcoxon signed rank test), and on simulation studies performed by Pacific Northwest National Laboratories that formed the basis for an approximate formula that is based on the normal distribution. Essentially, the formula is the one that might be used if a normal-based test were being performed, but an adjustment is made (multiply by 1.16) to account for the intent to perform a non-parametric test. The formula is as follows:

$$n = 1.16\left[\frac{s^2}{\Delta^2}(z_{1-\alpha} + z_{1-\beta(\mu)})^2 + 0.5z_{1-\alpha}^2\right]$$

where,

- n is the number of samples
- s is the estimated standard deviation of PCB concentrations
- Δ is the width of the gray region (the difference between the threshold value in stated in the hypothesis and the point at which β is specified)

α is the significance level or Type I error tolerance
$\beta(\mu)$ Type II error tolerance
z is a quantile from the standard normal distribution

This formula is based on a hypothesis test. For this problem, it is of interest to compute the number of samples needed to determine if the average total PCBs concentration at the site, after remediation, does not exceed the threshold of 0.22 ppm, the corresponding hypothesis test can be stated as follows:

$$H_o : \mu \geq 0.22 ppm\ PCB$$
$$H_A : \mu \leq 0.22 ppm\ PCB$$

That is, the null hypothesis is that the mean total PCBs concentration exceeds the threshold, and the alternative is that the mean does not exceed the threshold. The "gray region" (term of art used in the Data Quality Objectives process) is specified at one end by the point at which α is specified, i.e., 0.22 ppm, and at the other end by a value of the mean (μ) at which the Type II error is specified.

The common default values that are used for α and β are 5% and 20%, however, EPA does not recommend using these default values, but recommends instead that the stakeholders establish appropriate values based on the decision error consequences. These common defaults do not address the width of the gray region or, hence, the possible average concentration at which the Type II error is specified. In the tables that follow, various combinations of input values are used, including: values of α of 5%, 10% and 15%; values of β of 15%, 20%, and 25%; and a gray region of width 10%, 20% and 30% of the action level. Note that as error rates increase, sample size decreases, as the size of the gray region increases, sample size decreases, and as variance increases sample size increases.

Random placement of the sample locations or boreholes is also an assumption of the algorithm used. However, good spatial coverage rather than pure random placement is recommended. This is common practice and is assumed to have little impact on the statistics, but considerable impact on common sense arguments for sampling coverage.

That describes the basic mathematics, but there are other assumptions that are required to complete the calculations. There are some statistical assumptions for the underlying hypothesis testing procedure regarding independence (lack of spatial correlation) and symmetry that are usually difficult to verify up front, but this is commonly ignored for the purpose of sample size calculations (simplicity). There is also the issue that residential human health risk assessments are usually made on 1/8-acre areas (exposure units).

Before presenting the results, it is important to note that the data presented in Appendix A do not necessarily represent all of the data collected at this site. They represent all of the data that could be assimilated for these sample size calculations. The data could not be provided in electronic form, and were instead constructed from hard copy data tables and figures that identified

locations and total PCBs values. The figures were of poor quality, and the data tables were incomplete. This probably does not have a large effect on the calculations performed, because the bulk of the data have been included. However, some of the data in Appendix A might have been transcribed incorrectly, and some data are missing. If a complete and correct database were made available, the results of these sample size calculations might be different, although it is expected that they would not be very different.

The site is approximately 60 acres containing land that is slated for residential use and some washes that are slated for non-use or recreational use. However, for these sample size calculations the future land use is assumed to be residential for the entire site. Consequently, the threshold concentration for total PCBs is 0.22 mg/kg. Data collected at the site have been used to identify areas that require remediation for this land use endpoint. Consequently, the data can be separated into distinct subsets. The subset of interest for this case is data that represent samples from outside of the areas to be remediated. This is because these data are assumed to represent post-remediation conditions at the site, at least for the purpose of sample size calculations.

The variance or standard deviation estimate was estimated from the available data (please see Appendix A) from the 30 acres of interest (i.e. outside the contaminated area that is subject to remediation). When non-detects had detection limits reported, these values were used as surrogate concentrations in the sample size calculation. When non-detected data were not assigned a detection limit, zero was used as a concentration in the calculation. Table 1 shows the sample sizes calculated assuming various combinations of input values for the sample size equation.

Table 1: Sample size results for the risk-based decision

Number of Samples (s = 0.0474 ppm)				
Threshold = 0.22 ppm PCBs		**$\alpha = 5\%$**	**$\alpha = 10\%$**	**$\alpha = 15\%$**
$\Delta = 0.022$ ppm* (10%)	**$\beta = 15\%$**	40	30	24
	$\beta = 20\%$	35	25	20
	$\beta = 25\%$	31	22	16
$\Delta = 0.044$ ppm (20%)	**$\beta = 15\%$**	11	8	6
	$\beta = 20\%$	**10**	7	5
	$\beta = 25\%$	9	6	5
$\Delta = 0.066$ ppm (30%)	**$\beta = 15\%$**	6	4	3
	$\beta = 20\%$	5	4	3
	$\beta = 25\%$	5	3	2

The sample size corresponding to the default values for α and β of 5% and 20%, and a difference of 20% from the threshold value is 10. A different sample size can be chosen from this table or recalculated if different assumptions based on stakeholder input are preferred. This means,

roughly, that a decision error tolerance of 5% of deciding that the site has a mean concentration less than the threshold of 0.22 mg/kg total PCBs, when it is in fact greater has been assumed (site is "clean" when it is "dirty"). *The site will only be proved "clean" in this instance if the mean concentration after collecting the 10 samples is less than 0.22 mg/kg – 0.044 mg/kg total PCBs (i.e., 0.176 mg/kg total PCBs, and hence accommodating the delta in Table 1).* In addition, a decision error tolerance of 20% of deciding that the site is "dirty" when it is "clean" has also been assumed. That is, given these specific assumptions, after remdiation has been successfully performed, 10 samples will be needed to confirm that the site does not pose an unacceptable risk for a residential risk scenario.

One of the curiosities of these types of statistical calculations is that the number of potential samples is assumed to be infinite (i.e., there are infinitely many choices of soil samples). That means that this same sample size applies to some extent regardless of the actual area of interest. This is because the underlying statistical model simply involves testing or estimation of a mean concentration based on random sampling. There are no spatial components to this statistical model. Consequently, the chosen samples size (e.g., 10) could be applied to the entire site, or, for example, to each 1 acres sub-area. Ultimately, the

Appendix A: Hard copy of Data provided to Neptune 7/2005

source	boring	depth	total.pcb	detect
frey	67	0.75	9,560.000	D
frey	37	0.75	3,877	D
frey	47	1.5	2,181	D
frey	37	1.5	1,092	D
earthsafe	B3	1.0	499	D
frey	71	0.75	457.000	D
frey	58	0.75	442.000	D
frey	80	0.75	271.000	D
frey	85	1.5	194.200	D
frey	38	1.5	186.400	D
earthsafe	B1	0.5	162	D
frey	70	0.75	159.600	D
frey	38	0.75	149.600	D
frey	57	0.75	143.200	D
frey	58	1.5	140.600	D
frey	53	0.75	135.800	D
frey	85	0.75	130.000	D
frey	93	1.5	127.800	D
frey	80	1.5	124.500	D
frey	93	0.75	111.400	D
frey	81	0.75	109.000	D
frey	72	0.75	105.400	D
frey	36	0.75	103.200	D
frey	53	1.5	89.200	D
frey	66	0.75	86.300	D
frey	136A	1.5	85.200	D
frey	136	0.75	65.800	D
frey	70	1.5	62.700	D
frey	67	1.5	57.600	D
frey	77	0.75	53.400	D
frey	61	0.75	52.600	D
frey	47	0.75	52.400	D
frey	43	0.75	45.500	D
frey	61	1.5	43.800	D
frey	45	0.75	43.000	D
frey	120	1.5	42.300	D
frey	136B	0.75	40.100	D
frey	93	3	36.100	D
frey	96	3	35.200	D
frey	42	3	33.500	D
frey	34	1.5	33.000	D
frey	34	0.75	31.300	D
frey	81	3	31.200	D
earthsafe	B21	0.75	31.0	D
frey	36	1.5	27.920	D
frey	59	0.75	27.700	D
frey	77	1.5	27.120	D
geomatrix	TP103	0.5	24.000	D

frey	43	3	23.800	D
frey	136A	0.75	23.540	D
frey	66	1.5	23.400	D
frey	94	0.75	23.072	D
frey	45	1.5	22.580	D
frey	41	0.75	22.460	D
frey	83	0.75	22.300	D
frey	42	0.75	21.500	D
frey	72	1.5	20.860	D
earthsafe	B21	3.0	19.8	D
earthsafe	B7	3.0	19.8	D
frey	65	0.75	17.400	D
geomatrix	TP109	2.5	17.000	D
frey	84	1.5	16.920	D
earthsafe	B7	0.75	16.7	D
frey	46	0.75	16.600	D
frey	58	3	15.500	D
frey	41	1.5	13.360	D
frey	59	1.5	12.480	D
frey	46	1.5	12.300	D
frey	120	0.75	12.200	D
earthsafe	B10	1.5	11.6	D
frey	178	0.75	11.220	D
frey	136C	0.75	10.020	D
frey	32	0.75	9.680	D
frey	49	1.5	9.540	D
earthsafe	B23	0.75	8.78	D
frey	86	1.5	8.580	D
frey	32	1.5	8.460	D
frey	81	1.5	8.340	D
earthsafe	B23	3.0	7.93	D
frey	89	0.75	7.300	D
frey	33	3	6.840	D
frey	86	0.75	6.760	D
frey	53	5	6.640	D
frey	49	0.75	6.600	D
frey	48	0.75	6.580	D
geomatrix	TP106	0.5	6.400	D
earthsafe	B5	2.0	6.34	D
geomatrix	TP107	2.5	6.200	D
frey	96	0.75	6.200	D
frey	33	0.75	5.890	D
earthsafe	B6	0.75	5.70	D
frey	83	1.5	5.220	D
frey	83	3	5.080	D
geomatrix	TP69	2.5	4.700	D
frey	84	0.75	4.570	D
frey	78	0.75	4.320	D
geomatrix	TP69	0.5	4.300	D
earthsafe	B18	0.75	3.72	D
frey	81	5	3.550	D

frey	29	0.75	3.420	D
frey	136B	1.5	3.330	D
frey	43	5	3.188	D
frey	71	1.5	3.180	D
frey	42	1.5	3.020	D
geomatrix	TP113	2.5	3.000	D
geomatrix	TP98	0.5	3.000	D
frey	136C	1.5	2.930	D
geomatrix	TP105	0.5	2.900	D
frey	64	1.5	2.848	D
frey	94	1.5	2.544	D
geomatrix	TP104	0.5	2.520	D
frey	33	1.5	2.472	D
frey	63	1.5	2.360	D
frey	53	3	2.340	D
earthsafe	B22	0.75	2.04	D
frey	74	0.75	2.010	D
frey	122	1.5	2.000	D
frey	57	1.5	1.877	D
frey	118	1.5	1.860	D
frey	163	0.75	1.785	D
frey	37	5	1.720	D
frey	163	1.5	1.663	D
frey	96	1.5	1.631	D
frey	60	0.75	1.611	D
geomatrix	TP105	2.5	1.600	D
earthsafe	B18	3.0	1.58	D
geomatrix	TP109	0.5	1.570	D
frey	122	3	1.565	D
frey	73	0.75	1.561	D
geomatrix	TP101	0.5	1.500	D
frey	60	1.5	1.486	D
frey	78	1.5	1.425	D
frey	48	1.5	1.424	D
earthsafe	B22	3.0	1.37	D
frey	173A	0.75	1.263	D
frey	136	1.5	1.250	D
geomatrix	TP99	0.5	1.230	D
geomatrix	TP108	0.5	1.210	D
frey	65	1.5	1.210	D
frey	87	0.75	1.136	D
geomatrix	TP107	0.5	1.060	D
geomatrix	TP100	0.5	1.050	D
earthsafe	B11	1.5	1.03	D
frey	89	3	1.028	D
frey	39	0.75	0.850	D
earthsafe	B9	0.5	0.821	D
frey	47	3	0.810	D
frey	48	3	0.791	D
frey	49	3	0.786	D
frey	45	3	0.778	D

frey	86	3	0.758	D
frey	87	1.5	0.732	D
geomatrix	TP111	0.5	0.700	D
frey	75	0.75	0.678	D
geomatrix	TP78	0.5	0.660	N
earthsafe	B8	5.0	0.652	D
frey	22	0.75	0.646	D
frey	63	0.75	0.584	D
frey	118C	1.5	0.577	D
frey	59	5	0.576	D
earthsafe	B9	3.0	0.545	D
geomatrix	TP79	0.5	0.500	D
frey	173	0.75	0.439	D
frey	37	3	0.432	D
geomatrix	TP79	2.5	0.400	D
geomatrix	TP112	0.5	0.380	D
geomatrix	TP80	0.5	0.380	N
frey	173	1.5	0.372	D
frey	73	1.5	0.361	D
frey	22	1.5	0.354	D
geomatrix	TP108	2.5	0.330	D
frey	62	3	0.327	D
frey	99	1.5	0.313	D
frey	118C	0.75	0.309	D
geomatrix	TP70	0.5	0.300	N
frey	118	0.75	0.288	D
frey	140	0.75	0.287	D
frey	89	1.5	0.279	D
frey	118	3	0.265	D
frey	64	0.75	0.263	D
geomatrix	TP64	0.5	0.260	N
frey	61	3	0.235	D
frey	95	0.75	0.215	D
earthsafe	B14	3.0	0.210	D
earthsafe	B10	3.0	0.207	D
geomatrix	TP104	2.5	0.200	D
frey	173B	0.75	0.198	D
frey	62	1.5	0.196	D
geomatrix	TP73	0.5	0.190	N
frey	74	1.5	0.190	D
earthsafe	B14	0.75	0.186	D
frey	44	5	0.185	D
geomatrix	TP72	0.5	0.180	N
frey	63	3	0.176	D
earthsafe	B19	3.0	0.170	D
frey	147	0.75	0.163	D
frey	166	0.75	0.162	D
earthsafe	B2	0.75	0.161	D
geomatrix	TP65	0.5	0.160	N
geomatrix	TP67	0.5	0.160	N
frey	87	3	0.155	D

geomatrix	TP71	0.5	0.150	N
frey	62	5	0.149	D
frey	71	3	0.140	D
earthsafe	B20	3.0	0.133	D
geomatrix	TP75	0.5	0.130	N
geomatrix	TP77	0.5	0.130	N
geomatrix	TP110	0.5	0.120	D
geomatrix	TP68	0.5	0.120	N
earthsafe	B15	3.0	0.114	D
earthsafe	B19	0.75	0.111	D
geomatrix	TP74	0.5	0.110	N
frey	43	1.5	0.108	D
earthsafe	B3	4.0	0.105	D
frey	29	1.5	0.103	D
earthsafe	B1	3.0	0.101	D
frey	70	3	0.099	D
frey	147	1.5	0.099	D
earthsafe	B16	0.75	0.098	D
frey	66	3	0.082	D
geomatrix	TP76	0.5	0.079	N
geomatrix	TP66	0.5	0.076	N
frey	178	1.5	0.067	D
frey	22	3	0.066	N
frey	23	3	0.066	N
frey	23	1.5	0.066	N
frey	29	3	0.066	N
frey	33	5	0.066	N
frey	34	3	0.066	N
frey	36	3	0.066	N
frey	38	3	0.066	N
frey	39	3	0.066	N
frey	39	1.5	0.066	N
frey	41	3	0.066	N
frey	43	10	0.066	N
frey	44	10	0.066	N
frey	46	3	0.066	N
frey	48	5	0.066	N
frey	50	3	0.066	N
frey	50	1.5	0.066	N
frey	50	0.75	0.066	N
frey	51	1.5	0.066	N
frey	51	0.75	0.066	N
frey	57	3	0.066	N
frey	59	3	0.066	N
frey	60	3	0.066	N
frey	62	0.75	0.066	N
frey	63	5	0.066	N
frey	64	3	0.066	N
frey	65	3	0.066	N
frey	67	5	0.066	N
frey	67	3	0.066	N

frey	75	3	0.066	N
frey	77	3	0.066	N
frey	78	3	0.066	N
frey	81	10	0.066	N
frey	83	5	0.066	N
frey	84	3	0.066	N
frey	86	5	0.066	N
frey	93	5	0.066	N
frey	95	3	0.066	N
frey	95	1.5	0.066	N
frey	97	5	0.066	N
frey	98	3	0.066	N
frey	98	1.5	0.066	N
frey	99	3	0.066	N
frey	99	0.75	0.066	N
frey	118	6	0.066	N
frey	122	0.75	0.066	N
frey	123	1.5	0.066	N
frey	123	0.75	0.066	N
frey	124	1.5	0.066	N
frey	124	0.75	0.066	N
frey	126	1.5	0.066	N
frey	126	0.75	0.066	N
frey	132	1.5	0.066	N
frey	136	3	0.066	N
frey	138	1.5	0.066	N
frey	138	0.75	0.066	N
frey	140	1.5	0.066	N
frey	142	1.5	0.066	N
frey	142	0.75	0.066	N
frey	144	1.5	0.066	N
frey	144	0.75	0.066	N
frey	148	1.5	0.066	N
frey	148	0.75	0.066	N
frey	149	1.5	0.066	N
frey	149	0.75	0.066	N
frey	159	1.5	0.066	N
frey	159	0.75	0.066	N
frey	161	1.5	0.066	N
frey	163	3	0.066	N
frey	166	1.5	0.066	N
frey	169	1.5	0.066	N
frey	169	0.75	0.066	N
frey	173	3	0.066	N
frey	174	1.5	0.066	N
frey	174	0.75	0.066	N
frey	176	1.5	0.066	N
frey	176	0.75	0.066	N
frey	178	3	0.066	N
frey	203	1.5	0.066	N
frey	203	0.75	0.066	N

frey	118B	1.5	0.066	N
frey	118B	0.75	0.066	N
frey	173B	1.5	0.066	N
frey	173C	1.5	0.066	N
frey	173C	0.75	0.066	N
frey	161	0.75	0.0646	D
earthsafe	B6	3.0	0.060	D
frey	168	1.5	0.0536	D
geomatrix	TP100	2.5	0.05	N
geomatrix	TP101	2.5	0.05	N
geomatrix	TP102	2.5	0.05	N
geomatrix	TP102	0.5	0.050	N
geomatrix	TP103	2.5	0.05	N
geomatrix	TP106	2.5	0.05	N
geomatrix	TP110	2.5	0.05	N
geomatrix	TP111	2.5	0.05	N
geomatrix	TP112	2.5	0.05	N
geomatrix	TP113	0.5	0.050	N
geomatrix	TP98	2.5	0.05	N
geomatrix	TP99	2.5	0.05	N
earthsafe	B16	3.0	0.048	D
frey	122	6	0.039	D
earthsafe	B15	0.75	0.036	D
earthsafe	B17	3.0	0.030	D
frey	162	0.75	0.0285	D
frey	168	0.75	0.0282	D
frey	173A	1.5	0.0274	D
frey	75	1.5	0.021	D
frey	94	3	0.019	D
frey	98	0.75	0.018	D
frey	162	1.5	0.0167	D
earthsafe	B13	0.75	0.015	D
earthsafe	B24	0.75	0.014	D
earthsafe	B12	0.75	0.012	D
earthsafe	B17	0.75	0.012	D
frey	132	0.75	0.0118	D
earthsafe	B11	4.0	0.0	N
earthsafe	B12	3.0	0.0	N
earthsafe	B13	3.0	0.0	N
earthsafe	B2	3.0	0.0	N
earthsafe	B20	0.75	0.0	N
earthsafe	B24	3.0	0.0	N
earthsafe	B4	2.0	0.0	N
frey	23	0.75	0.009	D
frey	118A	0.75	0.00748	D

APPENDIX H

CALSCIENCE QUALITY ASSURANCE/QUALITY CONTROL MANUAL

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QUALITY SYSTEMS MANUAL FOR ENVIRONMENTAL ANALYTICAL SERVICES

Calscience Environmental Laboratories, Inc.

Version 3.0
July 2003

Prepared By

Calscience Environmental Laboratories, Inc.
7440 Lincoln Way
Garden Grove, CA 92841-1432
Telephone: (714) 895-5494
Facsimile: (714) 894-7501

Based On

National Environmental Laboratory Accreditation Program (NELAP)
Chapter 5 (Quality Systems)
NELAP Voted Version 14 – 29 June 2000

Michael J. Crisostomo
QUALITY ASSURANCE MANAGER

Virginia Huang
TECHNICAL DIRECTOR

Steven L. Lane
LABORATORY DIRECTOR

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TABLE OF CONTENTS
QUALITY SYSTEMS MANUAL

PREFACE TO THE QUALITY SYSTEMS MANUAL

Purpose

The purpose of this document is to provide implementation guidance on the establishment and management of quality systems for Calscience Environmental Laboratories, Inc. and is based on the National Environmental Laboratory Accreditation Conference's (NELAC) Quality System requirements.

Background

To be accredited under the National Environmental Laboratory Accreditation Program (NELAP), laboratories shall have a comprehensive quality system in place, the requirements for which are outlined in NELAP Chapter 5 (Quality Systems).

Project Specific Requirements

Project-specific requirements or regulations may supersede requirements contained in this manual. The laboratory bears the responsibility for meeting all **State requirements**. Nothing in this document relieves any laboratory from complying with contract requirements or with **Federal, State, and/or local regulations**.

Results and Benefits

- **Standardization of Processes** – Because this manual will provide the laboratory with a comprehensive set of requirements that meet the needs of many clients, as well as NELAP, the laboratory may use it to create a standardized quality system. Ultimately, this standardization will save laboratory resources by establishing one set of consistent requirements for all environmental work. Primarily, the laboratory bears the responsibility for meeting all State requirements as outlined in their respective certification programs.

- **Deterrence of Improper, Unethical, or Illegal Actions** – Improper, unethical, or illegal activities committed by only a few laboratories have implications throughout the industry, with negative impacts on all laboratories. This manual establishes a minimum threshold program for all laboratories to use to deter and detect improper, unethical, or illegal actions.

- **Foundations for the Future** – A standardized approach to quality systems, shared by laboratories and the NELAP, paves the way for the standardization of other processes. For example, this manual might serve as a platform for a standardized strategy for Performance Based Measurement System (PBMS) implementation.

Document Format

Because the *Quality Systems Manual* is designed to complement and implement NELAP Chapter 5 (Quality Systems), that document serves as the primary text for this implementation manual. The section numbering has been changed from that of NELAP Chapter 5 as the manual is meant to be a stand-alone document. The number 5 has been eliminated from all section and subsection headings. However, second-level numbering has been retained to ensure maintenance of a parallel organization to the NELAC Quality Systems requirements. For instance, Section 5.4.2 in NELAP Chapter 5 (referencing Chapter 5 of the NELAC standards) is equivalent to Section 4.2 in this manual. In addition, there is one set of NELAC appendices.

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ACROYNM LIST

°C: Degrees Celsius
ANSI/ASQC: American National Standards Institute/American Society for Quality Control
ASTM: American Society for Testing and Materials
CAS: Chemical Abstract Service
CCV: Continuing calibration verification
CFR: Code of Federal Regulations
CLP: Contract Laboratory Program
COC: Chain of custody
CV: Coefficient of variation
DO: Dissolved oxygen
DOC: Demonstration of capability
DQOs: Data quality objectives
EPA: Environmental Protection Agency
g/L: Grams per liter
GC/MS: Gas chromatography/mass spectrometry
ICP-MS: Inductively coupled plasma-mass spectrometer
ICV: Initial calibration verification
ID: Identifier
ISO/IEC: International Standards Organization/International Electrotechnical Commission
LCS: Laboratory control sample
LQMP: Laboratory Quality Management Plan
MDL: Method detection limit
mg/kg: Milligrams per kilogram
MS: Matrix spike
MSD: Matrix spike duplicate
NELAC: National Environmental Laboratory Accreditation Conference
NELAP: National Environmental Laboratory Accreditation Program
NIST: National Institute of Standards and Technology
OSHA: Occupational Safety and Health Administration
PBMS: Performance Based Measurement System
PC: Personal computer
PCBs: Polychlorinated biphenyls
PT: Proficiency testing
QA: Quality assurance
QAD: Quality Assurance Division (EPA)
QAMS: Quality Assurance Management Section
QAPP: Quality Assurance Project Plan
QC: Quality control
RL: Reporting limit
RPD: Relative percent difference
RSD: Relative standard deviation
SD: Serial dilutions
SOP: Standard operating procedure
TSS: Total suspended solids
UV: Ultraviolet
VOC: Volatile organic compound

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QUALITY SYSTEMS

Quality Systems include all quality assurance (QA) policies and quality control (QC) procedures that are delineated in a Quality Manual and followed to ensure and document the quality of the analytical data. Calscience, accredited under the National Environmental Accreditation Program (NELAP), assures implementation of all QA policies and the applicable QC procedures specified in this Manual. The QA policies, which establish essential QC procedures, are applicable to all areas of Calscience, regardless of size and complexity.

The intent of this Chapter is to provide sufficient detail about quality management requirements so that all accrediting authorities evaluate laboratories consistently and uniformly.

NELAC is committed to the use of Performance Based Measurement Systems (PBMS) in environmental testing and provides the foundation for PBMS implementation in these standards. While this standard may not currently satisfy all the anticipated needs of PBMS, NELAC will address future needs within the context of State statutory and regulatory requirements and the finalized EPA implementation plans for PBMS.

Chapter 5 is organized according to the structure of ISO/IEC Guide 25, 1990. Where deemed necessary, specific areas within this Chapter may contain more information than specified by ISO/IEC Guide 25.

All items identified in this Manual shall be available for on-site inspection or data audit.

1.0 SCOPE

a) This Manual sets the general requirements that Calscience must successfully demonstrate to be recognized as competent to perform specific environmental tests.

b) This Manual includes additional requirements and information for assessing competence or for determining compliance by the organization or accrediting authority that grants approval.

   If more stringent standards or requirements are included in a mandated test method or by regulation, the laboratory demonstrates that such requirements are met. If it is not clear which requirements are more stringent, the standard from the method or regulation is to be followed. (See the supplemental accreditation requirements in Section 1.9.2 of NELAC.)

c) Calscience uses this Manual in the development and implementation of its quality systems. Accreditation authorities shall use this to assess the competence of environmental laboratories.

2.0 REFERENCES

See Appendix A.

3.0 DEFINITIONS

The relevant definitions from ISO/IEC Guide 2, ISO 8402, ANSI/ASQC E-4, 1994, the EPA "Glossary of Quality Assurance Terms and Acronyms," and the *International vocabulary of basic and general terms in metrology (VIM)* are applicable. The most relevant is quoted in Appendix A, Glossary, of Chapter 1 of NELAC, together with further definitions applicable for the purposes of this Standard.

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4.0 ORGANIZATION AND MANAGEMENT

4.1 Legal Definition of Laboratory

Calscience is legally definable as evidenced by its business license, and current California Department of Health Services Environmental Laboratory Accreditation Program (CADHS ELAP) certificate. It is organized and operates in such a way that its facilities meet the requirements of the Standard. See the graphical presentations of the Organization and QA responsibility in Figures 4.1 and 4.2, respectively.

4.2 Organization

Calscience:

a) Has a managerial staff with the authority and resources necessary to discharge their duties;

b) Has processes to ensure that its personnel are free from any commercial, financial and other undue pressure that adversely affect the quality of their work;

c) Is organized in such a way that confidence in its independence of judgment and integrity is maintained at all times;

d) Specifies and documents the responsibility, authority, and interrelationship of all personnel who manage, perform or verify work affecting the quality of calibrations and tests;

   Such documentation includes:

   1) A clear description of the lines of responsibility in the laboratory, and is proportioned such that adequate supervision is ensured, and

   2) Job descriptions for all positions.

e) Provides supervision by persons familiar with the calibration or test methods and procedures, the objective of the calibration or test, and the assessment of the results.

   The ratio of supervisory to non-supervisory personnel ensures adequate supervision and adherence to laboratory procedures and accepted techniques.

f) Has a technical director who has overall responsibility for the technical operation of Calscience.

   The technical director certifies that personnel who perform the tests for which the laboratory is accredited have the appropriate educational and/or technical background. Such certification is documented.

   The technical director meets the requirements specified in the Accreditation Process. (See NELAC Section 4.1.1.1.)

g) Has a quality assurance manager who has responsibility for the quality system and its implementation.

   The quality assurance officer has direct access to the technical director and to the highest level of management at which decisions are made regarding laboratory policy or resources.

   The quality assurance manager (and/or his/her designees):

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1) Serves as the focal point for QA/QC activities, and is responsible for the oversight and/or review of quality control data;

2) Has functions independent from laboratory operations for which she/he has quality assurance oversight;

3) Is able to evaluate data objectively and perform assessments without outside (e.g., managerial) influence;

4) Has documented training and/or experience in QA/QC procedures and is knowledgeable in the quality system, as defined under NELAC;

5) Has a general knowledge of the analytical test methods for which data review is performed;

6) Arranges for and conduct internal audits as per 5.3 annually; and

7) Notifies Calscience management of deficiencies in the quality system and monitors corrective action.

h) Nominates, by way of the "Alternates List," deputies in case of absence of the technical director and/or the quality assurance officer;

i) Calscience makes every effort to ensure the protection of its clients' information as confidential and proprietary.
   ii) Calscience is sensitive to the fact that much of the analytical work performed for clientele may be subject to litigatory processes. Calscience, therefore, holds all information in strict confidence with laboratory release only to the client.
   iii) Information released to entities other than the client is performed only upon written request from the client.
   iv) Due to the investigative nature of most site assessments, analytical information may become available to regulatory agencies or other evaluating entities during site assessment of the laboratory for the specific purpose of attaining laboratory certifications, accreditations, or evaluation of laboratory qualification for future work. During these occurrences, the laboratory will make every effort to maintain the confidence of client specific information.

j) For purposes of qualifying for and maintaining accreditation, participates in a proficiency test program as outlined in Chapter 2 of NELAC. Results of Calscience's performance in rounds of proficiency testing are available by request.

5.0 QUALITY SYSTEM – ESTABLISHMENT, AUDITS, ESSENTIAL QUALITY CONTROLS, AND DATA VERIFICATION

5.1 Establishment

Calscience establishes and maintains quality systems based on the required elements contained in this Manual and appropriate to the type, range and volume of environmental testing activities it undertakes.

a) The elements of this quality system are documented in this quality manual.

b) The quality documentation is available for use by all laboratory personnel.

c) The laboratory defines and documents its policies and objectives for, and its commitment to accepted laboratory practices and quality of testing services.

ED_005263_00001892-00102

d) The laboratory management ensures that these policies and objectives are documented in the quality manual and are communicated to, understood and implemented by all laboratory personnel concerned.

i. All staff members are issued a copy of the quality manual at the commencement of work at Calscience. Employees read and endorse the following statement when they receive their quality manual: "By signature below, I acknowledge that I have received a copy of Revision [number] of Calscience's Quality Assurance Program Manual dated [effective date of the subject manual]. Furthermore, I agree to read and abide by the policies contained therein."

ii. A controlled copy of the quality manual is also available at the designated data reduction areas.

e) The quality manual is maintained current under the responsibility of the quality assurance officer. This manual is reviewed on an annual basis or more frequently, and revised as necessary. The review process begins in January of each year, and concludes on/before March of the same year. Where no revision is required, the manual is reissued in its entirety and review is scheduled for January of the following year.

5.2 Quality Manual

This quality manual and related quality documentation state Calscience's policies and operational procedures established in order to meet the requirements of this Standard.

This Manual lists on the title page: a document title; the laboratory's full name and address; the name, address, and telephone number of individuals responsible for the laboratory; the name of the quality assurance manager; the identification of all major organizational units that are covered by this quality manual and the effective date of the version.

This quality manual and related quality documentation also contains:

a) A quality policy statement, including objectives and commitments, by top management;

i. Calscience Environmental Laboratories, Inc. (Calscience) is committed to providing the highest quality environmental analytical services available. To ensure the production of scientifically sound, legally defensible data of known and proven quality, an extensive Quality Assurance program has been developed and implemented. This document, Calscience's Quality Assurance Program Manual, presents an overview of the essential elements of our Quality Assurance program. Calscience has modeled this manual after EPA guidelines as outlined in "Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans", Office of Monitoring Systems and Quality Assurance, Office of Research and Development, U.S. EPA, EPA-600/4-83-004, February, 1983. Calscience's QA Program is closely monitored at the Corporate, Divisional, and Group levels, and relies on clearly defined objectives, well-documented procedures, a comprehensive quality assurance/quality control system, and management support for its effectiveness.

ii. This QA Program Manual is designed to control and monitor the quality of data generated at Calscience. The essential elements described herein are geared toward generating data that is in compliance with federal regulatory requirements specified under the Clean Water Act, the Safe Drinking Water Act, the Resource Conservation and Recovery Act, the Comprehensive Environmental Response, Compensation, and Liability Act, and applicable amendments, and state and DoD/DoE equivalents. Although the quality control requirements of these various programs are not completely consistent, each of the programs base data quality judgments on the following

ED_005263_00001892-00103

three types of information, the operational elements of each being described elsewhere in this manual.

- ⇨ Data which indicates the overall qualifications of the laboratory to perform environmental analyses;
- ⇨ Data which measures the laboratory's daily performance using a specific method; and
- ⇨ Data which measures the effect of a specific matrix on the performance of a method.

iii. It is important to note that the QA guidelines presented herein will always apply unless adherence to specific Quality Assurance Project Plans (QAPPs) or client and/or regulatory agency specific requirements are directed. In these cases, the elements contained within specified direction or documentation shall supersede that contained herein.

iv. This manual is a living document subject to periodic modifications to comply with regulatory changes and technological advancements. All previous versions of this document are obsolete. Users are urged to contact Calscience to verify the current revision of this document.

b) The organization and management structure of the laboratory, its place in any parent organization and relevant organizational charts;

See Figure 4.1 Organizational Chart, and Figure 4.2 QA Responsibility Chart.

c) The relationship between management, technical operations, support services and the quality system;

d) Procedures to ensure that all records required under the NELAP are retained, as well as procedures for control and maintenance of documentation through a document control system which ensures that all standard operating procedures, manuals, or documents clearly indicate the time period during which the procedure or document was in force;

i. Ensuring a high quality work product in the environmental laboratory not only requires adherence to the quality issues discussed in the previous sections, but also requires the ability to effectively archive, restore, and protect the records that are generated.

ii. Procedures are in place to ensure that all records are retained. In addition, a documentation control system is employed to clearly indicate the time period during which a standard operating procedure, manual, or document was in force. These procedures are outlined in the laboratory standard operating procedure SOP-T002.

iii. All laboratory logbooks, instrument response printouts, completed analytical reports, chain-of-custodies, and laboratory support documentation are stored for a minimum of five years. Project specific data are stored in sequentially numbered project files and include copies of the applicable laboratory logbooks, instrument response printouts, completed analytical reports, chain-of-custodies, and any other pertinent supporting documentation.

iv. When complete, the project specific data are high speed optically scanned and transformed into digital CD media. Additional copies of these records are created at the time of scanning and are stored off-site for protection of the data. These records are stored for a minimum of five years.

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FIGURE 1: ORGANIZATIONAL CHART

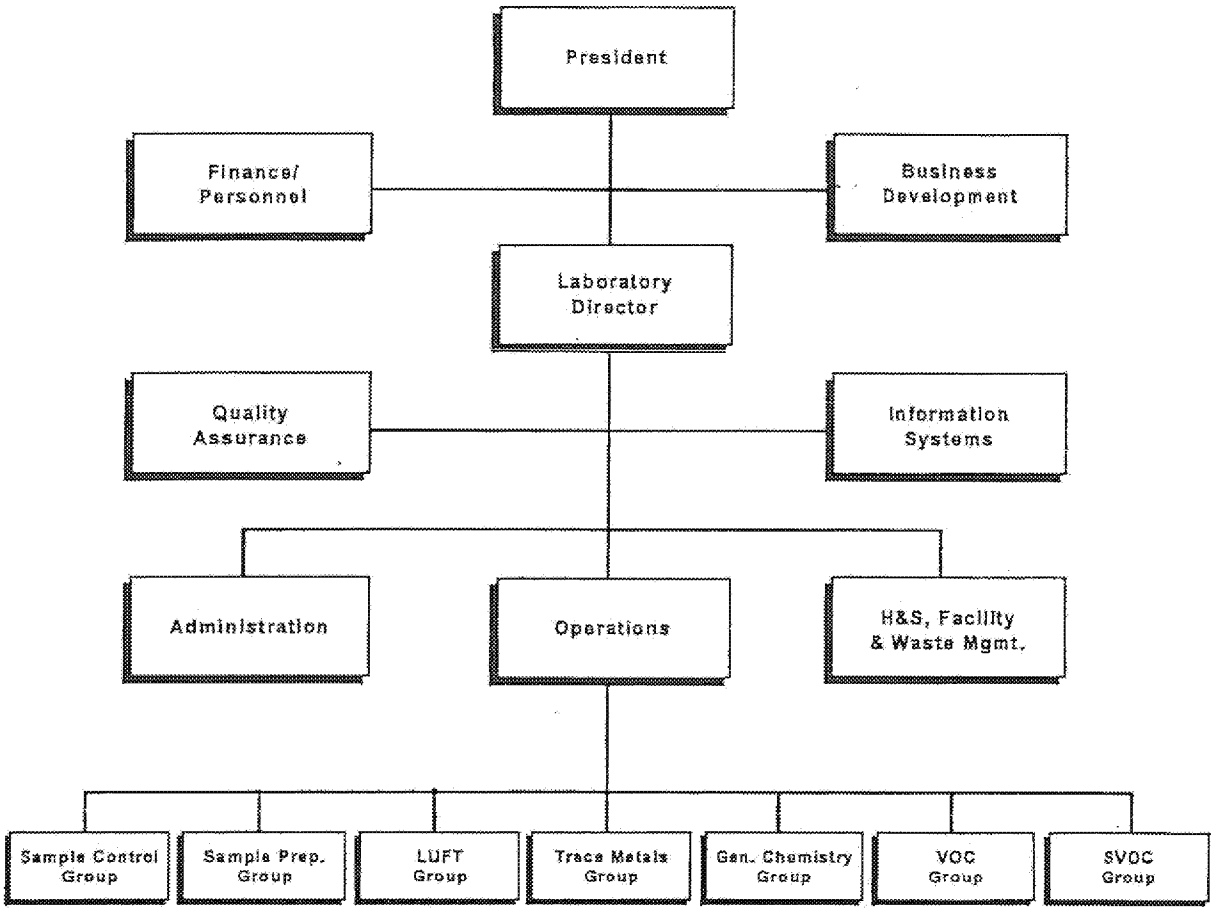

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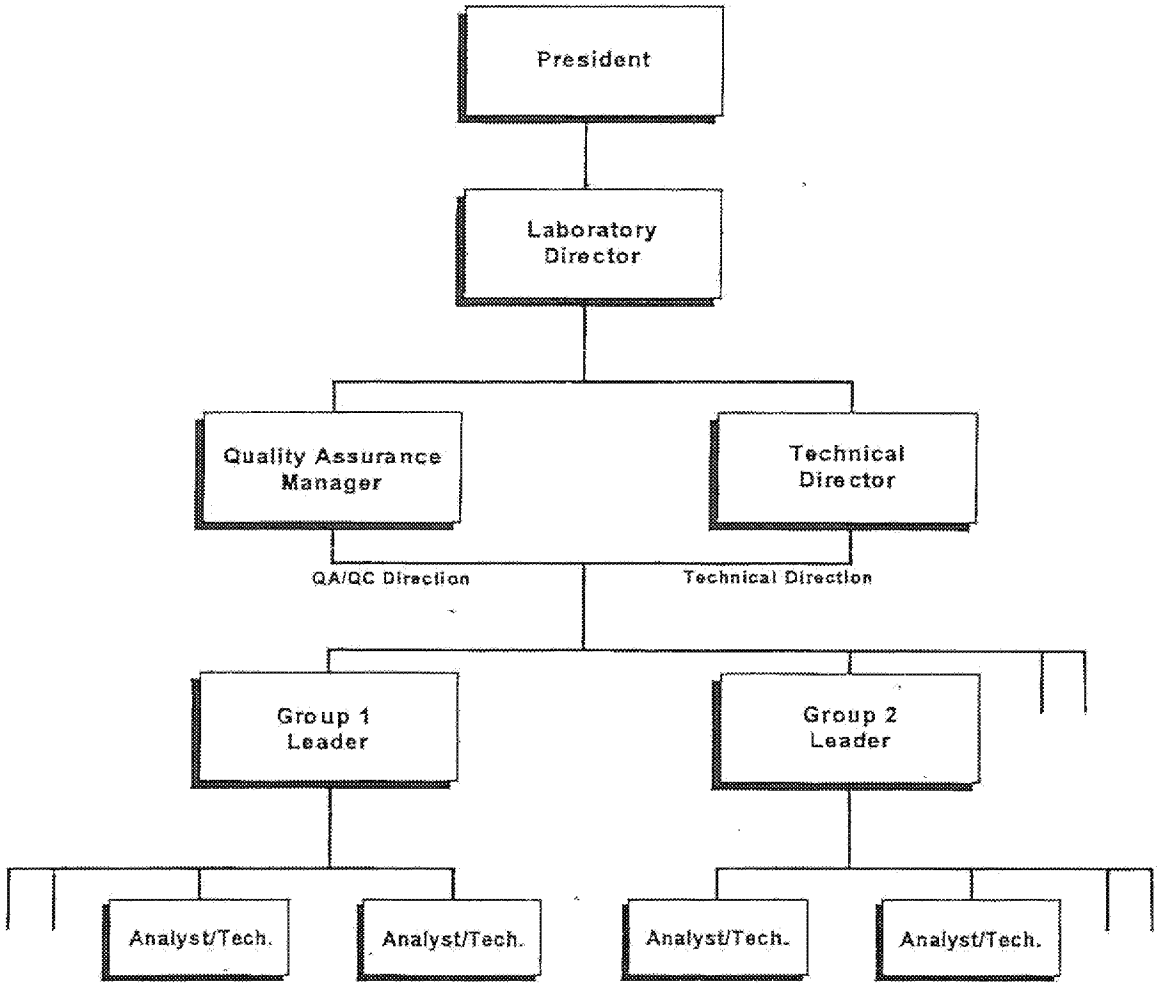
FIGURE 2: QA RESPONSIBILITY CHART



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v. Access to all systems is limited by use of log-in and password protection and is maintained by the system administrator.

There are four forms of electronic data that are generated in the laboratory and a synopsis of the archiving of these data follows:

LIMS Database	
Backup frequency:	Daily
Backup media:	Hard Disk
Backup software:	MS SQL Server Backup
Backup versions kept:	Ten previous versions
Onsite copy:	Redundancy by using mirrored hard drive
Instrument Data	
Backup frequency:	Weekly
Backup media:	Quantum 4000 DLT Raid Tape and DLT Tape
Backup software:	Computer Associates ArcServIT
Backup versions kept:	All versions
Offsite copy:	One
Manual Data	
Backup frequency:	Weekly
Backup media:	Quantum 4000 DLT Raid Tape and DLT Tape
Backup software:	Computer Associates ArcServIT
Backup versions kept:	All versions
Offsite copy:	One
Hard Copy Data	
Backup media:	Digital CD
Backup software:	Xerox Pagis
Backup versions kept:	All versions
Offsite copy:	One

vi. All electronic records are stored for a minimum of five years.

e) Job descriptions of key staff and reference to the job descriptions of other staff;

i. Calscience's Laboratory Director, through its President, is the final authority on all issues dealing with data quality and has the authority to require that procedures be amended or discontinued, or analytical results voided or repeated. He or she also has the authority to suspend or terminate employees on the grounds of non-compliance with QA/QC procedures. In addition, the Laboratory Director:
   - ⇨ Ensures that Calscience remains current with all regulations which affects operations and disseminate all such changes in regulatory requirements to the QA Manager, Technical Director, and Group Leaders;
   - ⇨ Develops and implements Calscience's QA Program which assures that all data generated will be scientifically sound, legally defensible, and of known precision and accuracy;
   - ⇨ Conducts annual reviews of Calscience's QA Program;
   - ⇨ Routinely monitors the QA Program to ensure compliance;
   - ⇨ Develops and implement new and revised QA procedures to improve data quality;
   - ⇨ Coordinates all laboratory accreditation efforts;
   - ⇨ Develop and implement project specific QA plans (QAPPs); and
   - ⇨ Monitor in-house training on quality assurance and control.

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- ⇨ Develops and implements laboratory policy in order to review all new work and ensure that it has the appropriate facilities and resources to complete such work.

ii. The QA Manager has full authority through the Laboratory Director in matters dealing within the laboratory. The QA Manager can make recommendations to the Laboratory Director regarding the suspension or termination of employees on the grounds of non-compliance with QA/QC procedures. An alternate QA Manager is always assigned. In the absence of the primary designate, the alternate will act in the QA Manager's capacity with the full authority of the position as allowed by Calscience governing documents. In addition, the QA Manager performs the following:
   - ⇨ Implements Calscience's QA Program;
   - ⇨ Monitors the QA Program within the laboratory to ensure complete compliance with its objectives, QC procedures, holding times, and compliance with client or project specific data quality objectives;
   - ⇨ Distributes performance evaluation (PE) samples on a routine basis to ensure the production of data that meets the objectives of its QA Program;
   - ⇨ Maintains all SOPs used at Calscience;
   - ⇨ Maintains records and archives of all PE results, audit comments, and customer inquiries concerning the QA program;
   - ⇨ Performs statistical analyses of QC data and establish controls that accurately reflect the performance of the laboratory;
   - ⇨ Conducts periodic performance and system audits to ensure compliance with the elements of Calscience's QA Program;
   - ⇨ Prescribes and monitor corrective action;
   - ⇨ Serves as in-house client representative on all project inquiries involving data quality issues;
   - ⇨ Coordinates data review process to ensure that thorough reviews are conducted on all project files;
   - ⇨ Develops revisions to existing SOPs;
   - ⇨ Reports the status of in-house QA/QC to the Laboratory Director;
   - ⇨ Distributes new SOPs to all applicable lab areas;
   - ⇨ Maintains records and archives of all QA/QC data including but not limited to method detection limit (MDL) studies, accuracy and precision control charts, and completed log books; and
   - ⇨ Conducts and/or otherwise ensures that an adequate level of QA/QC training is conducted within the laboratory.

iii. The Technical Director has full authority through the Laboratory Director in matters dealing with technical proceedings within the laboratory. He or she can make recommendations to the Laboratory Director regarding the suspension or termination of employees on the grounds of non-compliance with QA/QC procedures. The Technical Director also
   - ⇨ Implements Calscience's training program to ensure that all personnel are properly trained for the tasks being performed;
   - ⇨ Resolves technical difficulties encountered during normal operations;
   - ⇨ Oversees all method developmental activities within Calscience;
   - ⇨ Ensures compliance with approved methodologies, standard operating procedures (SOPs), this manual, QAPPs, and all other governing documents; and
   - ⇨ Implements a system of continual improvement within Calscience, to include reviews of new technologies that may potentially improve quality.

iv. The Group Leaders have the authority to accept or reject data based on pre-defined QC criteria. In addition, with the approval of the QA Manager, the Group Leaders may accept data that falls outside of normal QC limits if, in his or her professional judgment, there are technical justifications for the acceptance of such data. The circumstances must be well documented and any need for corrective action identified must be defined and initiated. The authority of the Group Leaders in QC related matters results directly from the QA Manager. The Group Leaders also
   - ⇨ Actively support the implementation of Calscience's QA Program;
   - ⇨ Ensure that their employees are in full compliance with Calscience's QA Program;

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- ⇨ Maintain accurate (by recommending changes to) SOPs and enforce routine compliance with SOPs;
- ⇨ Conduct technical training of new staff and when modifications are made to existing procedures;
- ⇨ Perform secondary QC reviews on all data generated within their respective groups;
- ⇨ Maintain a work environment which emphasizes the importance of data quality; and
- ⇨ Provide support to all levels of Calscience Management.

v. Laboratory staff members have the authority to accept or reject data based on compliance with well-defined QC acceptance criteria. Their supervisor must approve the acceptance of data that falls outside the QC criteria.
- ⇨ Maintain a working knowledge of Calscience's QA Program;
- ⇨ Ensure that all data is generated in compliance with Calscience's QA Program;
- ⇨ Perform work in strict accordance with the SOPs;
- ⇨ Ensure that all documentation related to their work is complete, accurate, and legible; and
- ⇨ Immediately inform their supervisors of data quality problems.

vi. Project Managers
- ⇨ Maintain a working knowledge of Calscience's QA Program;
- ⇨ Verify that all final reports are in compliance with predetermined client- and/or project-specific criteria;
- ⇨ Ensure that all supporting documentation to a specific report is complete, accurate, and legible; and
- ⇨ Effectively track and implement systems that ensure the best available service to Calscience's customers.

f) Identification of the laboratory's approved signatories; at a minimum, the title page of the quality manual has the signed and dated concurrence (with appropriate titles) of all responsible parties including the QA manager, technical director, and the laboratory director;

g) The laboratory's procedures for achieving traceability of measurements;

h) A list of all test methods under which the laboratory performs its accredited testing may be found in the appendix of this manual;

i) Mechanisms for ensuring that the laboratory reviews all new work to ensure that it has the appropriate facilities and resources before commencing such work;

j) Reference to the calibration and/or verification test procedures used;

Calibration procedures and verification of acceptability for each set of required calibrations are defined in Section 13 (Calibration) and Section 12 (Quality Control) of each standard operating procedure.

k) Procedures for handling samples received;

The generation of quality analytical data begins with the collection of the sample and, therefore, the integrity of the sample collection process is of importance to Calscience. Samples must be collected in such a way that foreign material is not introduced into the samples and that analytes of interest do not escape from the samples or degrade prior to their analysis. To ensure sample integrity and representativeness, the following items must be considered:

- ⇨ Samples must be collected in appropriate containers. In general, glass containers are used for organic analytes and polyethylene for inorganic/metal analytes;

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⇨ Only new sample containers which are certified and documented clean in accordance with U.S. EPA OSWER Directive No. 9240.0-0.05 specifications shall be provided by Calscience for sample collection;

Calscience's chain-of-custody document is used to forward samples from the client to the laboratory. As the basic elements of most all chain-of-custody documents are similar, clientele may choose to use their own chain-of-custody document to forward samples to Calscience.

Upon receipt by Calscience, samples proceed through an orderly processing sequence designed to ensure continuous integrity of both the sample and its documentation from sample receipt through its analysis and beyond.

All coolers that are received by the Sample Control Group undergo a preliminary examination in accordance with Part A of the Sample Receipt Form. Specifically, each sample is carefully examined for label identification, proper container (type and volume), chemical preservation when applicable, container condition, and chain-of-custody documentation consistency with sample labels. Discrepancies are noted on the Sample Receipt Form, the chain-of-custody and, if possible, discussed with the client prior to his or her departure. If this is not possible, the discrepancies are communicated to the client for resolution prior to the completion of the log-in process. The temperature of the cooler is measured and, with other observations, is recorded in Part B of the Sample Receipt Form. Additional comments are recorded in Part C of the Sample Receipt Form.

During the log-in process each sample is assigned a unique laboratory identification number through a computerized Laboratory Information Management System (LIMS), which stores all essential project information. Calscience maintains multiple security levels of access into LIMS to prevent unauthorized tampering/release of sample and project information.

Once all analyses for a sample have been completed and the sample container is returned to Sample Control, it shall remain in refrigerated storage for a period not less than 30 days following sample receipt unless the client requests return/forwarding of the sample. Following the 30-day refrigerated storage period, the samples are placed into ambient storage for another period not less than 30 days after which the samples are bulked into drums for later disposal.

l) Reference to the major equipment and reference measurement standards used as well as the facilities and services used by the laboratory in conducting tests;

A list of major equipment is kept up-to-date on the List of Major Assets. This, as well as a list of reference measurement standards and their certificates of calibration, is maintained by the QA Manager.

m) Reference to procedures for calibration, verification and maintenance of equipment;
Laboratory SOPs (T042, T050 and T051) are available to staff for calibration, verification and maintenance of equipment.

n) Reference to verification practices which may include interlaboratory comparisons, proficiency testing programs, use of reference materials and internal quality control schemes;

Instrument calibration is required to ensure that the analytical system is operating correctly and functioning at the proper sensitivity such that required reporting limits can be met. Each instrument is calibrated with standard solutions appropriate to the type of instrument and the linear range established for the analytical method. The manufacturer's guidelines, the analytical method, and/or the requirements of special contracts determine the frequency of calibration and the concentration of calibration standards, whichever is most applicable. The following are very general guidelines and are not meant to be all-inclusive. Detailed calibration procedures are specified in the SOP for each method performed.

ED_005263_00001892-00110

Gas Chromatography/Mass Spectroscopy (GC/MS): Each day prior to analysis of samples, all GC/MS instruments are tuned with 4-bromofluorobenzene (BFB) for VOCs and decafluorotriphenylphosphine (DFTPP) for SVOCs in accordance with the tuning criteria specified in the applicable methods. Samples are not analyzed until the method-specific tuning requirements have been met.

After the tuning criteria are met, the instrument is then calibrated for all target analytes and an initial multipoint calibration curve established. Alternatively, the previous calibration curve may be used if validated by a calibration verification (CV) standard. All target analytes are represented in the calibration and certain key target analytes referred to as system performance calibration compounds (SPCCs) and calibration check compounds (CCCs) are used for curve acceptance determination. For the initial calibration to be deemed acceptable, the SPCCs and CCCs must meet established acceptance criteria and must be re-evaluated and meet the acceptance criteria, at a minimum, every twelve (12) hours thereafter.

Non-GC/MS Chromatography: The field of chromatography involves a variety of instrumentation and detectors. While calibration standards and control criteria vary depending upon the type of system and analytical methodology required for a specific analysis, the general principles of calibration apply uniformly. Each chromatographic system is calibrated prior to sample analysis. An initial multipoint calibration curve is generated using all target analytes. All target analytes must meet the acceptance criteria for the calibration to be deemed acceptable. The continued validity of the initial multipoint calibration is verified every 12 hours using a calibration verification (CV) standard containing all target analytes. If the CV fails to meet the acceptance criteria, the system is re-calibrated and all samples analyzed since the last acceptable CV must be re-analyzed.

Inductively Coupled Plasma Emission Spectroscopy: Initial calibration consists of a calibration blank (CB) plus one calibration standard. The calibration is verified by the re-analysis of the standard and initial calibration verification (ICV) standard. If the standard and the ICV fail to meet the acceptance criteria, the initial calibration is considered invalid and is re-performed.

Continuing calibration verification (CCV) consists of a mid-concentration standard plus a calibration blank (CB) analyzed every 10 samples and at the end of the sequence. If the CCV and/or CB fail to meet the acceptance criteria, the instrument must be re-calibrated and all samples analyzed since the previous acceptable CCV and/or CB must be re-analyzed.

ICP/MS Spectroscopy: Each day prior to the analysis of samples, all ICP/MS instruments undergo mass calibration and resolution checks prior to initial calibration. Initial calibration consists of a calibration blank (CB) and at least one calibration standard. The calibration is verified by the re-analysis of the standard and initial calibration verification (ICV) standards. If the standard and the ICV fail to meet the acceptance criteria, the initial calibration is considered invalid and is re-performed.

Continuing calibration verification (CCV) consists of a mid-concentration standard plus a calibration blank (CB) analyzed every 10 samples and at the end of the sequence. If the CCV and/or CB fail to meet the acceptance criteria, the instrument must be re-calibrated and all samples analyzed since the previous acceptable CCV and/or CB must be re-analyzed.

Flame and Graphite Furnace Atomic Absorption Spectroscopy: Initial calibration consists of a calibration blank plus a low, medium, and high calibration standard. Continuing calibration verification (CCV) consists of midpoint calibration standard plus a calibration blank (CB) analyzed every 10 samples and at the end of the sequence. If the CCV and/or CB fail to meet the acceptance criteria, the instrument must be re-calibrated and all samples analyzed since the previous acceptable CCV and/or CB must be re-analyzed. If the calibration blanks contain target analyte concentrations exceeding the acceptance limits, the cause must be determined and corrected.

ED_005263_00001892-00111

General Inorganic Analyses: General inorganic (non-metal) analyses involve a variety of instrumental and wet chemistry techniques. While calibration procedures vary depending on the type of instrumentation and methodology, the general principles of calibration apply universally. Each system or method is initially calibrated using standards prior to analyses being conducted with continual verification that the calibration remains acceptable throughout analytical processing. If continual calibration verification fails to meet the acceptance criteria, the instrument must be re-calibrated and all samples analyzed since the previous acceptable CCV must be re-analyzed.

o) Procedures to be followed for feedback and corrective action whenever testing discrepancies are detected, or departures from documented policies and procedures occur;

These procedures may be found in SOP-T015 (Error Correction of Test Records) and SOP-T022 (Corrective Actions).

p) The laboratory management arrangements for permitting exceptions and departures from documented policies and procedures or from standard specifications;

Calscience's SOPs are in substantial conformity with their corresponding published method references. Departure from approved SOPs shall be approved if necessary or appropriate due to the nature or composition of the sample or otherwise based on the reasonable judgment of Calscience's Laboratory Director, Technical Director, or QA Manager. Departures shall be made on a case-by-case basis consistent with recognized standards of the industry. In no case shall departures be approved without written communication between Calscience and the affected client.

q) Procedures for dealing with complaints;

Procedures for dealing with complaints may be found in SOP-T018, Handling of Complaints.

r) Procedures for protecting confidentiality (including national security concerns) and proprietary rights;

Calscience is sensitive to the fact that much of the analytical work performed for clientele may be subject to litigatory processes. Calscience, therefore, holds all information in strict confidence with laboratory release only to the client. Information released to entities other than the client is performed only upon written request from the client.

Due to the investigative nature of most site assessments, analytical information may become available to regulatory agencies or other evaluating entities during site assessment of the laboratory for the specific purpose of attaining laboratory certifications, accreditations, or evaluation of laboratory qualification for future work. During these occurrences, the laboratory will make its best effort to maintain the confidence of client specific information.

s) Procedures for audits and data review;

Calscience participates in a wide variety of system and performance audits conducted by numerous federal and state agencies, as well as through its major clientele. These audits are conducted to verify that analytical data produced conforms to industry standards on a routine basis.

A System Audit is a qualitative evaluation of the measurement systems utilized at Calscience, specifically, that Calscience has, in place, the necessary facilities, staff, procedures, equipment, and instrumentation to generate acceptable data. This type of audit typically involves an on-site inspection of the laboratory facility, operations, and interview of personnel by the auditing agency.

A Performance Audit verifies the ability of Calscience to correctly identify and quantitate compounds in blind check samples. This type of audit normally is conducted by the auditing agency through

ED_005263_00001892-00112

laboratory participation in round robin Performance Evaluation (PE) programs. Examples of current PE program involvement include those conducted by the USEPA (WS/WP and DMR-QA), CADHS/ELAP (solids and bioassay), and ERA InterLaB Soil Studies, as well as programs administered by major industry.

In addition to performance and system audits conducted by auditing agencies or clients, Calscience's QA Manager in association with the Laboratory Director regularly generates quarterly QA Reports.

A reporting system is a valuable tool for measuring the overall effectiveness of Calscience's QA program. It serves as an instrument for evaluating the program's design, identification of problems and trends, and planning for future needs.

The Quarterly QA Reports normally addresses the following information:

- ⇨ Laboratory certifications and approvals;
- ⇨ System and performance audits;
- ⇨ Performance evaluation studies;
- ⇨ LIMS
- ⇨ Performance on major contracts; and
- ⇨ Miscellaneous issues.

The QA goals for the following year will be included in the last Quarterly QA Report of every year.

Should the result of any audit detect a significant error, which has been identified to adversely affect released data, the situation shall be thoroughly investigated. Corrective measures shall be enacted to include system re-evaluation, the determined affect on released data and client notification, as necessary.

t) Processes/procedures for establishing that personnel are adequately experienced in the duties they are expected to carry out and are receiving any needed training;

Quality control begins prior to sample(s) receipt at the laboratory. The selection of well qualified personnel, based upon education and/or experience is the first step in successful laboratory management. A thorough screening of job applicants and selection of the best candidate to fulfill a well-defined need is as important an aspect of a successful QA/QC program as a careful review of analytical data.

Employee training and approval procedures used at Calscience are specified in SOP-T010, "Employee Training", and includes but is not limited to the following:

- ⇨ A thorough understanding of the applicable regulatory method and Calscience SOP;
- ⇨ A review of Calscience's QA Program Manual and thorough understanding of the specifics contained therein that are directly related to the analysis to be performed;
- ⇨ Instruction by the applicable Group Leader on all aspects of the analytical procedure;
- ⇨ Performance of analyses under supervision of experienced laboratory personnel, which shall include analysis of blind QC check samples, when deemed appropriate;
- ⇨ Participation in in-house seminars on analytical methodologies and procedures;
- ⇨ Participation in job related seminars outside of the laboratory; and
- ⇨ Participation in conventions and meetings, i.e., ACS, etc.

u) Ethics policy statement developed by the laboratory and processes/procedures for educating and training personnel in their ethical and legal responsibilities including the potential punishments and penalties for improper, unethical, or illegal actions;

ED_005263_00001892-00113

A vital part of Calscience Environmental Laboratories' analytical laboratory services is their Laboratory Ethics Training Program. An effective program starts with an Ethics Policy Statement that is supported by all staff, and is reinforced with initial and ongoing ethics training.

"It shall be the policy of Calscience to conduct all business with integrity and in an ethical manner. It is a basic and expected responsibility of each staff member and manager to hold to the highest ethical standard of professional conduct in the performance of all duties."

A proactive ethics training program is the most effective means of deterring and detecting improper, unethical, or illegal actions in the laboratory. There are three facets to the program: (1) clearly define improper, unethical, and illegal actions; (2) outline elements of prevention and detection programs for improper, unethical, or illegal actions; and (3) identify examples of inappropriate (i.e., potentially fraudulent) laboratory practices.

Definition of Improper, Unethical, and Illegal Actions

Improper actions are defined as deviations from contract-specified or method-specified analytical practices and may be intentional or unintentional.

Unethical or illegal actions are defined as the deliberate falsification of analytical or quality assurance results, where failed method or contractual requirements are made to appear acceptable.

Prevention of laboratory improper, unethical, or illegal actions begins with a zero-tolerance philosophy established by management. Improper, unethical, or illegal actions are detected through the implementation of oversight protocols.

Prevention and Detection Program for Improper, Unethical, or Illegal Actions

Calscience management has implemented a variety of proactive measures to promote prevention and detection of improper, unethical, or illegal activities. The following components constitute the basic program:

⇨ An Ethics and Data Integrity Agreement that is read and signed by all personnel;
⇨ Initial and annual ethics training;
⇨ Internal audits;
⇨ Inclusion of anti-fraud language in subcontracts;
⇨ Analyst notation and sign-off on manual integration changes to data;
⇨ Active use of electronic audit functions when they are available in the instrument software; and
⇨ A "no-fault" policy that encourages laboratory personnel to come forward and report fraudulent activities.

A proactive, "beyond the basics" approach to the prevention of improper, unethical, or illegal actions are a necessary part of laboratory management. As such, in addition to the requirements above, Calscience has a designated ombudsman (data integrity officer) to whom laboratory personnel can report improper, unethical, or illegal practices, or provide routine communication of training, lectures, and changes in policy intended to reduce improper, unethical, or illegal actions.

Examples of Improper, Unethical, or Illegal Practices

Documentation that clearly shows how all analytical values were obtained are maintained by Calscience and supplied to the data user as needed. To avoid miscommunication, Calscience clearly documents all errors, mistakes, and basis for manual integrations within the project file and case narrative as applicable. Notification is also made to the appropriate supervisor so that appropriate corrective actions can be initiated. Gross deviations from specified procedures are investigated for potential improper, unethical, or illegal actions, and findings of fraud are fully

ED_005263_00001892-00114

investigated by senior management. Examples of improper, unethical, or illegal practices are identified below:

- ⇨ Improper use of manual integrations to meet calibration or method QC criteria (for example, peak shaving or peak enhancement are considered improper, unethical, or illegal actions if performed solely to meet QC requirements);
- ⇨ Intentional misrepresentation of the date or time of analysis (for example, intentionally resetting a computer system's or instrument's date and/or time to make it appear that a time/date requirement was met);
- ⇨ Falsification of results to meet method requirements;
- ⇨ Reporting of results without analyses to support (i.e., dry-labbing);
- ⇨ Selective exclusion of data to meet QC criteria (for example, initial calibration points dropped without technical or statistical justification);
- ⇨ Misrepresentation of laboratory performance by presenting calibration data or QC limits within data reports that are not linked to the data set reported, or QC control limits presented within QAPP that are not indicative of historical laboratory performance or used for batch control;
- ⇨ Notation of matrix inference as basis for exceeding acceptance limits (typically without implementing corrective actions) in interference-free matrices (for example, method blanks or laboratory control samples);
- ⇨ Unwarranted manipulation of computer software (for example, improper background subtraction to meet ion abundance criteria for GC/MS tuning, chromatographic baseline manipulations);
- ⇨ Improper alteration of analytical conditions (for example, modifying EM voltage, changing GC temperature program to shorter analytical run time) from standard analysis to sample analysis;
- ⇨ Misrepresentation of QC samples (for example, adding surrogates after sample extraction, omitting sample preparation steps for QC samples, over- or underspiking); and
- ⇨ Reporting of results from the analysis of one sample for those of another.

v) Reference to procedures for reporting analytical results;

Standard operating procedures pertaining to the reporting of results are available to all laboratory personnel. They are: SOP-T009, Significant Figures, Rounding, and Reporting of Results; SOP-T025, Reporting of Tentatively Identified Compounds (TICs); and T-026, Reporting of Data Qualifiers.

All analytical data generated within Calscience is thoroughly checked for accuracy and completeness. The data validation process consists of data generation, reduction, and four levels of review as described below.

The analyst generating the analytical data has the primary responsibility for its correctness and completeness. All data is generated and reduced following protocols specified in the appropriate SOPs. Each analyst reviews the quality of his or her work based upon an established set of guidelines specified in the SOPs or as specified by project requirements. The analyst reviews the data package to ensure that:

- ⇨ Holding times have not been exceeded;
- ⇨ Sample preparation information is correct and complete;
- ⇨ Analysis information is correct and complete;
- ⇨ The appropriate procedures were employed;
- ⇨ Analytical results are correct and complete;
- ⇨ All associated QC is within established control limits and, if not, out-of-control forms are completed thoroughly explaining the cause and corrective action taken;
- ⇨ Any special sample preparation and analytical requirements have been met; and
- ⇨ Documentation is complete, i.e., all anomalies in the preparation and analysis have been documented; out-of-control forms, if required, are complete, etc.

ED_005263_00001892-00115

The data reduction and validation steps are documented, signed, and dated by the analyst on the QC Review coversheet accompanying each data package. This initial review step, performed by the analyst, is designated as primary review. The analyst then forwards the data package to his or her Group Leader, or designated data reviewer, who performs a secondary review. Secondary reviews consist of an independent check equivalent to that of the primary review and are designed to ensure that:

- ⇨ Calibration data is scientifically sound, appropriate to the method, and completely documented;
- ⇨ QC data is within established guidelines or reported with appropriate clarification/qualification;
- ⇨ Qualitative identification of sample components is correct;
- ⇨ Quantitative results are correct;
- ⇨ Documentation is complete and any anomalies properly addressed and documented;
- ⇨ The data is ready for incorporation into the final report package; and
- ⇨ The data package is complete and ready for archiving.

A significant component of the secondary review is the documentation of any errors that have been identified and corrected during the review process. Calscience believes that the data package that is submitted for a secondary review should be free from errors. Errors that are discovered are documented and formally transmitted to the appropriate Group Leader. The cause of the errors are then addressed by additional training or clarification of procedures (SOP revisions) to ensure that similar errors do not recur and high quality data will be generated.

Signature of Data Reviewer and the date of review document the completion of secondary reviews on the QC Review coversheet. These constitute approval for data release and generation of analytical report.

During both of the QC review processes, 100% of the raw data associated with the entire project is available to the reviewer. Data packages are checked back to the raw data as deemed necessary by the reviewer.

Following draft report generation, the report is reviewed by the Project Manager to ensure that the data set and quality control data is complete and meets the specific requirements of the project. When available, the data is also evaluated against historical site information. Once all requested analytical work has been verified as complete, a final report is generated and signed by the Project Manager.

Following approval for release by the Project Manager, the Quality Assurance Manager or Designee to ensure that the analytical and quality control data is correct performs a final review. The Quality Assurance Manager reviews 10% of the project files back to the raw data.

A variety of reporting formats, from normal typed reports to computerized data tables to complex reports discussing regulatory issues are available. In general, Calscience reports contain the following information.

Analytical Data

Analytical data is reported by sample and test. Pertinent information including date(s) sampled, received, prepared, and analyzed are included on each results page. The reporting limit for each method analyte is also listed.

QC Data

A QC Summary is provided with each final report. Unless otherwise specified in a QAPP or requested by the client, QC Summaries include results for method blanks, matrix spikes, matrix spike duplicates, and surrogate spikes. Laboratory control sample and method blank surrogates are

ED_005263_00001892-00116

routinely included if matrix interference results in a QC outlier. The effective control limits for the reported QC values are also provided on the QC Summary as well as explanations for any QC outliers.

As required for the project, data reports from "results only" through "full CLP" will be generated and provided. Included in this range are reports for the major DoD programs including NFESC, AFCEE, and USACE.

Methodology

References for the analytical methodology employed are included on all final analytical reports.

Signatory

Final reports are ready for release to the client following review and approval by the Project Manager and QA Manager, as evidenced by their signature on the final report cover page.

Preliminary Data

Upon client request, preliminary data shall be released prior to completion of a full QC review. Preliminary data is subject to change pending QC review and, therefore, shall be clearly marked as "Preliminary, QC Pending" and not include a signature of approval. This qualification is provided as notification to the client that the data review process has not been completed yet and that the data is subject to possible modification resulting therefrom.

w) A Table of Contents and applicable lists of references and glossaries, and appendices.

5.3 Audits

5.3.1 Internal Audits

The laboratory arranges annual internal audits to verify that its operations continue to comply with the requirements of the laboratory's said quality system. The quality assurance officer plans and organizes audits as required by a predetermined schedule and requested by management. Trained and qualified personnel, who are wherever resources permit, independent of the activity to be audited, carry out such audits. Personnel do not audit their own activities except when it can be demonstrated that an effective audit will be carried out. Where the audit findings cast doubt on the correctness or validity of the laboratory's calibrations or test results, the laboratory takes immediate corrective action and immediately notifies, in writing, any client whose work was involved.

The outcome of internal audits is included in the applicable quarterly report to management. The QA Manager is responsible for maintaining these reports.

5.3.2 Managerial Review

Calscience management conducts an annual review of its quality system and its testing and calibration activities to ensure its continuing suitability and effectiveness and to introduce any necessary changes or improvements in the quality system and laboratory operations. This review takes account of reports from managerial and supervisory personnel, the outcome of recent internal audits, assessments by external bodies, the results of inter-laboratory comparisons or proficiency tests, any changes in the volume and type of work undertaken, feedback from clients, corrective actions, and other relevant factors. The laboratory shall have a procedure for review by management, and maintain records of review findings and actions.

ED_005263_00001892-00117

5.3.3 Audit Review

All audit and review findings and any corrective actions that arise from them are documented. The laboratory management ensures that these actions are discharged within the agreed time frame as indicated in the quality manual and/or SOPs.

5.3.4 Performance Audits

In addition to periodic audits, the laboratory ensures the quality of results provided to clients by implementing checks to monitor the quality of the laboratory's analytical activities. Examples of such checks are:

a) Internal quality control procedures using statistical techniques (see Section 5.4 below);

b) Participation in proficiency testing or other interlaboratory comparisons;

c) Use of certified reference materials and/or in-house quality control using secondary reference materials as specified in Section 5.4;

d) Replicate testing using the same or different test methods;

e) Re-testing of retained samples;

f) Correlation of results for different but related analysis of a sample (for example, total phosphorus should be greater than or equal to orthophosphate).

5.3.5 Corrective Actions

a) In addition to providing acceptance criteria and specific protocols for corrective actions in SOP-T022, the laboratory implements general procedures to be followed to determine when departures from documented policies, procedures and quality control have occurred. These procedures include but are not limited to the following:

   1) Identify the individual(s) responsible for assessing each QC data type;

   2) Identify the individual(s) responsible for initiating and/or recommending corrective actions;

   3) Define how the analyst shall treat a data set if the associated QC measurements are unacceptable;

   4) Specify how out-of-control situations and subsequent corrective actions are to be documented; and

   5) Specify procedures for management (including the QA officer) to review corrective action reports.

b) To the extent possible, sample results are reported only if all quality control measures are acceptable. If a quality control measure is found to be out of control, and the data are to be reported, all samples associated with the failed quality control measure are reported with the appropriate data qualifier(s).

ED_005263_00001892-00118

5.4 Essential Quality Control Procedures

These general quality control principles apply, where applicable, to all testing at Calscience. The manner in which each is implemented is dependent on the types of tests performed by the laboratory and is further described in Appendix D and in SOP-T020 (Internal Quality Control Checks. The standards for any given test type assures that the applicable principles are addressed:

a) All laboratories have detailed written protocols in place to monitor the following quality controls:

   1) Positive and negative controls (blanks, spikes, reference toxicants, etc.) to monitor tests;

   2) Tests to define the variability and/or repeatability of the laboratory results such as replicates;

   3) Measures to assure the accuracy of the test method including calibration and/or continuing calibrations, use of certified reference materials, proficiency test samples, or other measures;

   4) Measures to evaluate test method capability, such as detection limits and quantitation limits or range of applicability such as linearity;

   5) Selection of appropriate formulae to reduce raw data to final results such as regression analysis, comparison to internal/external standard calculations, and statistical analyses;

   6) Selection and use of reagents and standards of appropriate quality;

   7) Measures to assure the selectivity of the test for its intended purpose; and

   8) Measures to assure constant and consistent test conditions (both instrumental and environmental) where required by the test method, such as temperature, humidity, light, or specific instrument conditions.

b) All quality control measures are assessed and evaluated on an on-going basis, and quality control acceptance criteria are used to determine the usability of the data. (See Appendix D.)

c) The laboratory has procedures for the development of acceptance/rejection criteria where no method or regulatory criteria exist. (See 11.2, Sample Acceptance Policy.)

d) The quality control protocols specified in the method manual (10.1.2) is followed. Calscience ensures that the essential standards outlined in NELAC 5, Appendix D, or mandated methods or regulations (whichever are more stringent) are incorporated into the method manuals. When it is not apparent which is more stringent the QC in the mandated method or regulations is to be followed.

   The essential quality control measures for testing are found in Appendix D.

6.0 PERSONNEL

6.1 General Requirements for Laboratory Staff

Calscience's testing departments have a sufficient level of personnel with the necessary education, training, technical knowledge and experience to perform the assigned functions.

All personnel are responsible for complying with all quality assurance/quality control requirements that pertain to their organizational/technical function. Each technical staff member must have a combination

ED_005263_00001892-00119

of experience and education to adequately demonstrate a specific knowledge of their particular function and a general knowledge of laboratory operations, test methods, quality assurance/quality control procedures and records management.

6.2 Laboratory Management Responsibilities

In addition to Section 4.2.d, the laboratory management:

a) Defines the minimum level of qualification, experience and skills necessary for all positions in the laboratory. In addition to education and/or experience, basic laboratory skills such as using a balance and quantitative techniques, are considered.

b) Ensures that all technical laboratory staff members demonstrate capability in the activities for which they are responsible. Such demonstration is documented (See Appendix C).

   Note: In departments with specialized "work cells" (a well-defined group of analysts that together perform the method analysis), the group as a unit meets the above criteria and this demonstration is fully documented.

c) Ensures that the training of each member of the technical staff is kept up-to-date (on-going) by the following:

   1) Keeping evidence on file that demonstrates that each employee has read, understood, and is using the latest version of the laboratory's in-house quality documentation that relates to his/her job responsibilities.

   2) Documenting training courses or workshops on specific equipment, analytical techniques, or laboratory procedures.

   3) Documenting employee attendance at training courses on ethical and legal responsibilities including the potential punishments and penalties for improper, unethical or illegal actions. Keeping on file evidence that demonstrates that each employee has read, acknowledges, and understands their personal ethical and legal responsibilities including the potential punishments and penalties for improper, unethical or illegal actions.

   4) Maintains up-to-date analyst training records that contain a certification that technical personnel have read, understood and agreed to perform the most recent version of the test method (the approved method or standard operating procedure as defined by the laboratory document control system, 5.2.d) and documentation of continued proficiency by at least one of the following once per year:

      i. Acceptable performance of a blind sample (single blind to the analyst);

      ii. Another demonstration of capability;

      iii. Successful analysis of a blind performance sample on a similar test method using the same technology (e.g., GC/MS volatiles by purge and trap for Methods 524.2, 624, or 5035/8260) would only require documentation for one of the test methods;

      iv. At least four consecutive laboratory control samples with acceptable levels of precision and accuracy;

      v. If i-iv cannot be performed, analysis of authentic samples with results statistically indistinguishable from those obtained by another trained analyst.

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